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Abstracts of Tuberculosis ***will be published at intervals as an integral part of the*** **American Review of Tuberculosis.** ***It will receive separate paging and may, if desired, be bound separately at the completion of the volume.***

The Abstract Editor is Dr. George Mannheimer, 41 West 51st Street, New York City. Prompt transmission to him of reprints or abstracts of papers on tuberculosis, sanatorium or board of health reports, etc., will promote their early publication in this section.

Abstracts should be sent typewritten on one side of the page only. They should be as concise and compact as the subject matter of the article warrants. They should be headed with a short title, and followed by the full title of the paper, author's name, journal, date, volume and page.

Drugs in Tuberculosis.—It is now generally recognized that drugs occupy a secondary place in the treatment of tuberculosis, but unfortunately, it has been forgotten that they also occupy a necessary place. Without proper dietetic and hygienic management, drugs are of small service. On the other hand, recovery is often not complete and not maintained without them. The relative failure of sanatorium treatment is to be attributed to the neglect of their powerful aid. Two groups of remedies have "stood the test of time;" namely, certain iodin compounds, and creosote and its congeners. The use of calcium, introduced on the somewhat crude basis that calcification and fibrosis are the natural methods of healing of tubercles and tuberculous ulceration, is also commended. These drugs help tuberculous patients to recover and to stay "well." Iodin in the infiltrative stage; phenol, creosote or guaiacol for use in the more advanced stage, or in the presence of fever; and calcium for use throughout, are, although secondary, nevertheless necessary agents in the successful management of the great mass of cases of chronic pulmonary tuberculosis. They are to be used freely—with discretion to be sure, and with individualization—but also with persistence.—*The Place of Drugs in Tuberculosis, S. Solis-Cohen, Penna. M. J., October 1919, xxiii, No. 11.*

Treatment of Syphilis in Tuberculous Patients.—It is a not uncommon occurrence to find both a syphilitic and tuberculous infection in the same person. The literature is full of data as to the incidence of tuberculosis among syphilitics. The various investigators, however, worked on markedly different material, causing percentages to vary considerably. Tedeschi reports that 70 per cent of the cases of tuberculosis developing during a period of ten years in his prison service occurred on luetic soil. The other investigators' figures vary from 5 to 43 per cent. Bronfenbrenner attributes the frequency of tuberculosis among syphilitics to the syphilis as such or to the antisyphilitic treatment lowering the resistance of the patient so as to make him more susceptible to a new infection of tuberculosis or render him less resistant against the progress of the disease already contracted. He refers to the enthusiasm many clinicians showed, a few years ago, following a report that tuberculosis was greatly benefited by mercurial injections. The author states this report was a little premature as it was shown that these patients who showed improvement had syphilis also and that results were only temporary. According to Hartz and other observers, mercury was shown to be detrimental to patients with tuberculosis. With the advent of salvarsan many optimistic results have been reported.

The author's experience does not verify this. He gives many case reports of patients with a dual infection treated with arsphenamine alone and comes to the following conclusions: Mercury should be used with great caution in tuberculous patients. The deleterious effect is not immediate but appears months later as pointed out by Hartz. Arsphenamine is the drug of choice but should be given in small doses at long intervals as in his experience the ordinary dose accentuates active foci and is proved to cause a flare up in latent lesions.—*The Treatment of Syphilis in Tuberculous Patients, J. A. Elliott, Am. J. Syph., April 1919, iii, No. 2, 291.*

Treatment of Chronic Cough.—Voorhees classifies the causes of chronic cough under three heads: (1) mechanical irritation of the vagus; (2) bacterial infection somewhere along the path of the airways; (3) sensitization to protein toxin and to pollens. Mechanical causes are new growths, enlarged glands, diseased tonsils, aneurysm, elongated uvula; foreign body in the trachea, bronchi or lungs. Bacteria may include not only the pneumococcus, the tubercle bacillus, but even the common bacteria involved in ordinary colds. Foreign proteins may be from horse dandruff, chicken feathers, the hair of dogs, cats, mice, and rabbits; food proteins such as egg, lobster, veal, etc. If mechanical and sensitization causes can both be excluded then we have to deal chiefly with the activities of pus forming microörganisms. In such event an autogenous vaccine may be of great service in treatment, and acidosis must be guarded against by the administration of sodium bicarbonate, sodium citrate, and other alkalies in large doses plus the acid fruits. General tonics may be used with good effect, and of these strychnine is especially useful since it acts almost specifically on relaxed mucous membranes. Finally, antiseptic agents must be judiciously employed, as the silver salts, or the oily antiseptics, such as menthol in oil, thymol, oil of cloves, in from 5 to 25 per cent solution, 1 cc. being introduced into the trachea at each sitting and allowed to gravitate into the affected bronchus by the patient lying down on the side in question. Dichloramine-T in chlorcosane oil is one of the most active antiseptics for chronic infections and the only precautions to be observed are that the liquid be fresh, neither acid nor alkaline, free from foreign matter, and that it reach the free exposed surface where the bacteria are supposed to be. To succeed, the patient must be willing to have the X-ray and other tests which may be necessary.—*Causes, Diagnosis and Treatment of Chronic Cough, T. W. Voorhees, Am. Med., October 1919, xiv, No. 10, 635.*

The Surgical Treatment of Tuberculous Stenosis of the Larynx.—In the majority of cases, laryngeal stenosis is not a complication, but rather a clinical manifestation occurring during the ordinary evolution of tuberculosis of the larynx. The stenosis almost invariably progresses slowly and it is only at the ultimate phase of the process that a rapid progress of the lesion occurs which ends fatally. From the viewpoint of treatment, tuberculosis of the larynx is no longer a fatal affection. Unquestionably, local medical treatment may be very useful in certain cases and inhalations, fumigations and sprayings are precious adjuvants to the general antituberculous treatment. The same may be said of rest cures, climatotherapy and heliotherapy. But these therapeutic measures are often unsuccessful. The galvanocautery and the curette can be employed without danger in tuberculous lesions of the larynx and thyrotomy has been resorted to in order better to reach the stenosing lesions with these instruments. In a certain number of instances the results obtained have been good, but occasionally success has not been as favorable as might have been expected for the reason that complications have ensued. It seems necessary to determine the indications for other surgical procedures in tuberculous laryngeal stenosis. When the patient's general health is good or satisfactory, when the pulmonary lesions are limited in extent and follow a slow evolution, removal of the tuberculous granulations with the curette, cautery or cutting forceps by the endolaryngeal route may be attempted.

In a certain number of extremely favorable cases, a kind of radical cure may be essayed by the exolaryngeal route. By this technic tracheotomy, laryngectomy, laryngo-fissure or laryngostomy can be resorted to. The three latter operations have undoubtedly resulted successfully, but they have also been followed by numerous unsuccessful results in that cicatricial recurrence has taken place and for this reason considerable reserve should be maintained in regard to their real value. Tracheotomy alone is especially indicated in cases of stenosis of the larynx, the low operation being preferable, because it does not involve division of the cartilages and also because it will not compromise the success of further operations on the larynx. When the case is urgent, epiglottectomy should be done to relieve the dyspnea.—*Editorial, N. York M. J., March 20, 1920, cxi, 512.*

Tuberculin Treatment of Asthma Due to Tuberculous Glands.—Asthma from hilum and perihilum tuberculosis is common in childhood; asthma of this type is probably a form of anaphylaxis or allergy

toward the toxin of the tubercle bacillus. In a good percentage of cases tuberculin treatment rapidly improves the morbid process or even produces a radical cure. This improvement is much more rapid than in cases treated without tuberculin. Of course tuberculin is used in conjunction with other therapeutic measures.—*Tratamiento del asma ganglionar tuberculoso por la tuberculina, L. V. Blanco, Semana Med., June 12, 1919, xxvi, 624.*

X-rays in Tuberculous Adenitis.—Surgery alone in tuberculous adenitis does not usually give satisfactory results. Results in early cases with radium are undoubtedly good, but equally good results can be obtained with the X-rays, which are usually more easily available. X-ray treatment alone will cure the very early case, but it is usually best to operate when all periglandular inflammation has subsided and the glands can be detected only on careful palpation,—usually after six to eight weeks' X-ray treatment. If this is not done a considerable number of apparent cures relapse. Where softening is already present treatment should be surgical, followed by the X-rays very soon after operation. Discharging sinuses thus treated heal in a few weeks.—*X-rays in Treatment of Tuberculous Adenitis, F. Hernaman-Johnson, Brit. M. J., December 20, 1919, 812.*

Tuberculin.—Recent literature shows that most observers consider tuberculin of great assistance in pulmonary tuberculosis. Some observers are more conservative in their estimate of the value of tuberculin. Tuberculin has not been used extensively in the treatment of bone and joint tuberculosis, and by few orthopedic surgeons. Some believe that tuberculin in small doses at proper intervals is of undoubted value in the treatment of selected cases of tuberculous bone and joint infections. Others consider it to be of decided value in the treatment of tuberculous joints and that it can be administered during any stage of the disease. Tuberculin has not been given a sufficiently long or extensive trial in orthopedic cases and criticism in such cases would be unfair. Furthermore, the orthopedists had used tuberculin in either single, fairly large doses, or had repeated the same dose at short intervals. In this way they frequently got severe constitutional reactions. The belief has grown that for therapeutic purposes tuberculin should be given in increasing doses and regulated so as to avoid a reaction. For the proper management and treatment of a case of bone and joint tuberculosis with tuberculin, there were three essential factors: First, a correct diagnosis; second, a thorough knowledge of the symptoms, course of the disease, and probable complications; third, an accurate knowledge of the dose of tuberculin and its action. Tuberculin may be very toxic, and if unwisely or improperly administered harm may result. The patient may die. Great care must be exercised. It is argued that subcutaneous injections in increasing doses, beginning with small innocuous quantities, will cause the production of substances in the blood that will destroy or lysinize the tubercle bacilli. If the tuberculin is given in increasing and properly regulated doses the tubercle bacilli will gradually be killed and the patient will become resistant to tuberculous invasion through loss of hypersusceptibility to tubercle bacilli. Patients who receive tuberculin and do not receive orthopedic treatment are never cured. In a series of cases tuberculin was administered to the patients while they received orthopedic treatment. It was found that the patients were not cured by the administration of tuberculin. Not a single case was entirely successful. Tuberculin produced a tolerance for tuberculin and not for the tubercle bacillus or all of its toxins. The conclusions arrived at are: (1) Tuberculin does not cure tuberculosis of the bones and joints. (2) In the majority of cases, tuberculin therapy causes no noticeable beneficial influence upon the bone or joint lesion. (3) In a small proportion of cases there has been an improvement of the lesion. (4) In some cases there may be a distinct accentuation of the disease. (5) New abscesses may appear during and after completion of tuberculin treatment. (6) Relapses occur after apparent improvement.—*Tuberculin, S. Kleinberg, J. Orthop. Surg., December 1919, i, No. 12, 722.*

Tuberculin in Minutest Doses.—Only the minutest doses, long kept up, are effectual; the ordinary large doses used by others do actual damage. Success with these minutest doses is not confined to pulmonary tuberculosis but Poncet's "chronic tuberculous rheumatism" subsides under it likewise, and a number of other lesions and morbid conditions which have never been connected with tuberculosis hitherto. Their disappearance under this method of treatment throws new light on their etiology, so that this "tuberculin diagnostic-therapeutic test," is opening new fields for research and effectual treatment. It has proved exceptionally useful for the new recruits, disclosing those who already are infected even slightly, and enabling them to throw off the infection, while they are

spared the inconvenience and disappointments from futile treatment on other grounds. He has found the minute doses extremely useful further to stimulate the vital forces in advanced pulmonary tuberculosis, as, for instance, when artificial pneumothorax has ceased to prove effectual. The dose has been too large whenever disturbances of any kind follow. The No. 00 "ultrasmall dose" is 0.05 cc. of a 100.000,000 solution. The next lower strength is made with one part of this solution and nine parts distilled water containing ¼ per cent phenol. Further dilutions are made in the same way down to quintillions or beyond. The optimal dose is that followed by frank improvement in the morbid picture. The first improvement is usually transient, and the reappearance of symptoms is the signal for a new injection. It should never be made before the benefit from the preceding injection begins to decline. As treatment continues, the benefit is seen to be more and more lasting each time, demonstrating an actual cumulative beneficial action. There can thus be no regularity in the dates of the injections. The intervals vary from case to case and at different periods in the same patient. We see surprising benefit from tuberculin treatment in these minute doses in many morbid conditions which have never been supposed before to have any connection with tuberculosis. Their complete subsidence under this method of treatment certainly suggests that tuberculosis is one factor if not the only one. This group includes not only apical cases, but cases of peritonitis, pericolitis, enteritis in members of tuberculous families, joint, glandular and gastro-intestinal lesions, endocrine disturbances, etc. The tuberculin treatment reveals the tuberculous nature of the morbid process and often proceeds to cure it. In a case of unilateral optic neuritis, for instance, this treatment induced marked improvement and the presumptive diagnosis was confirmed by discovery of a minute tubercle close to the entrance of the optic nerve into the eye. Continuing the tuberculin treatment resulted in the complete subsidence of the lesion and recovery of vision. Both clinical, operative and necropsy findings have confirmed the tuberculous nature of this great variety of morbid conditions which show such marked improvement under these courses of minute doses of tuberculin. As long as appreciable improvement is manifest the same dose must be repeated indefinitely, merely "marking time to keep step," as it were.—*Sobre la prueba diagnostico, terapeutico de la tuberculina, J. J. Vitón, Sem. Med., July 10, 1919, xxvi, No. 28, 29.*

The Administration of Tuberculins.—Tuberculin has proved a valuable adjunct in the treatment of tuberculosis. It ought to be administered carefully, and only by one who is thoroughly familiar with its action and effects upon the tuberculous body. The initial doses should be smaller and the interval between doses longer in active cases. The clinical method of giving tuberculin is not always free from danger, because of the possibility of overstimulation, the only gauge indicating the approach of the overtolerant dose being the appearance of fever, headache, and pain. Another unfavorable factor for the clinical method is the likelihood of not causing any stimulation in the tuberculous foci if the doses are not increased rapidly enough, or if the interval between doses is too remote. The neutrophilic index may be used as the guide to the proper dose of tuberculin by the following method: If the neutrophilic index is 94, that is 94 per cent of polynuclear neutrophile leucocytes, with one solid lobule, and 6 per cent of polynuclear neutrophile leucocytes with two separate and distinct lobules, then give tuberculin. If the neutrophilic index is very low, 80 to 92, that is, 80 to 92 per cent of polynuclear neutrophile leucocytes, with one solid lobule and 20 to 8 per cent of polynuclear neutrophile leucocytes with two or more distinctly separate lobules, double the previous dose. If the index is repeatedly 94, increase the dose by one, two, or more tenths, according to the repeated index at 94. Never give tuberculin if the neutrophilic index is 96 or above, that is, 96 per cent of polynuclear neutrophile leucocytes with one solid lobule, and 4 per cent only of polynuclear neutrophile leucocytes with two or more lobules distinctly separate. By this method the dangers of tuberculin are eliminated and the best results are derived. We have a fair gauge when to start it, when to repeat or increase the dose, and especially when not to give it at all.—*The Administration of Tuberculins, W. J. Durel, New Orleans M. & S. J., October 1919, lxxii, No. 4, 164.*

Vaccination Against Tuberculosis.—Maragliano brings down to date his report on the vaccination of children and others against tuberculosis, which he has been advocating for twenty-five years. He aims to produce a minute focus by subcutaneous injection of dead tubercle bacilli, theorizing that in this focus antigens will be produced and that they will pass into the circulation from this focus, thus slowly and progressively inducing the production in the body of immunizing materials. His clinical and biologic tests have demonstrated that this

production of antibodies does actually occur. Research now under way with Sivori's modification of the fixation reaction test has shown an appreciable reaction in healthy persons in two weeks after the vaccination: First the antigens show up more and more while the antibodies are scanty; then the antibodies become more and more evident by the end of one and two months, and they become very pronounced by the end of the third month. Then the antibodies show an ascending curve while the antigen curve keeps low. By the end of the fourth month the two curves run parallel for two months and then the antigen curve descends strikingly while the antibody curve persists nearly the same in its later course. The same results were obtained in monkeys and cows as in man, and five monkeys thus vaccinated were injected at the fifth month with 0.1 mgm. of living bacilli, and all survived. Four of the five controls died within five months. All these findings harmonize with those obtained by study of the agglutinating and opsonic power after the vaccination. The findings were likewise positive in infants born from women that had been vaccinated in this way during pregnancy. Similar response to the tests were obtained by Levi at Parma; he determined the presence of antigens and antibodies in the blood of mother and fetus, in the placenta and in the milk.

The vaccination was applied to 3702 members of families with tuberculosis between 1907 and 1914. The later history of 1893 is known to date, 1915; of this number 1819 were living and 63 had died from other than tuberculous processes and only 11 had died from tuberculosis. All those vaccinated in 1907 were found to be in good health to date. Of 26 among the earliest vaccinated recently reëxamined by a naval medical officer, all were in robust health, while the complement deviation test revealed persistence of immune principles with predominance of antibodies. A number of persons have been vaccinated elsewhere and in other countries but Maragliano does not include these in his statistics. No inconveniences from the vaccination were ever observed, but the question whether the persons vaccinated might have escaped tuberculosis without this extraneous aid can be answered only by application of the method on a larger scale. At present, man can defend himself against tuberculosis only by acquiring a specific resistance against the bacillus which, notwithstanding all the measures of social prophylaxis, is bound to get to him. In this, Maragliano's research, that is, Italy, has led the way.— *Vaccinazione ed immunita antitubercolare—Studi vari sulla tubercolosi—Terapia specifica, E. Maragliano, Rif. Med., July 5, 1919, xxxv, No. 27, 542.*

Sun Treatment.—A new method of applying heliotherapy by means of a lens was called to the attention of Lovett in the spring of 1919, and he reports the results in a series of carefully observed cases of chronic suppuration in a children's hospital. It had been used by a Mrs. E. C. Post in her sanatorium at Porsmeur, in Brittany, it having first been suggested to her by M. de Thézac. The essential of the treatment is the concentration of the sun's rays by means of a double convex lens, diameter, 12 inches, and focal length, 6 feet. At the focal point, of course, the heat is too great, and in general the patient should be placed at a point where the sun's rays form a circle from 3 to 5 inches in diameter. As the patient is moved away from the lens, of course, the heat increases, and the nearer he is to it it decreases. Moving it thus back and forth is the method of regulating treatment. The lens is mounted a few inches from the end in a canvas cylinder, 1 foot in diameter and 3 feet long. The advantage of the cylinder is that it enables the lens to be pointed directly at the patient and makes the application more definite. The cylinder is on a tripod and can be turned in any direction. The duration of treatment must lengthen progressively, at first, five minutes, increasing five minutes each day until a limit of thirty minutes is reached. In one case a longer period, up to one and one-half hours, was used without harm. The skin around the wound is, as a rule, protected by towels, and the operator wears colored glasses. One treatment a day was given. The effect of the treatment on suppurating wounds was perfectly definite: (1) The discharge immediately increased and then diminished; (2) the granulation took on a healthier color if the patient was anemic, and (3) sensitiveness diminished. In order to test the efficacy of this treatment, a series of suppurating wounds of the severest type was selected, and cases that were obviously difficult. In the wards in a hospital for acute cases it was necessary to select a more acute type than would have been the case in an institution for chronic diseases, as patients that were doing well were discharged to the convalescent home on account of the need of beds, and chiefly the chronic suppurations that were resistant remained long enough to be observed under this treatment. A dozen cases are reported, all observed by members of the staff. Greater progress was made with this method than in those

cases treated by other means. In two acute osteomyelitis cases, in which it was used within a week after operation, it seemed too stimulating. Bacterial count was made in all cases at short intervals, and showed that it was lowered immediately in the discharge. The method seems free from risk when used as directed, and its value seems demonstrated in chronic suppuration from tuberculosis, syphilis and chronic osteomyelitis. The article is illustrated.—*The Thézac-Porsmeur Method of Sun Treatment, R. W. Lovett, J. Am. M. Ass., April 3, 1920, lxxiv, 944.*

Heliotherapy in Mediastinal Adenitis.—About forty to fifty per cent of cases of mediastinal adenopathy are practically cured by direct sunlight treatment, and among the remainder are few instances of complete failure of the treatment. Personal experience has convinced the author, however, that the procedure is by no means equally indicated in all cases. The best results are obtained in pure, uncomplicated adenopathy. In these, all physical and functional signs disappear after four to six months' treatment, and the results are confirmed by X-ray examination. On the other hand, in adenopathy associated with signs of tuberculous impregnation, discrete pulmonary lesions, or the simple bronchial or pulmonary reactions described by Hutinel, results can only be obtained much more slowly. The exposures to sunlight must be of shorter duration. One year should be considered the minimum period required for the treatment, and even at the end of this time there are likely to persist functional manifestations such as temperature instability, or an abnormal bronchial sensitiveness. Finally, a few of these patients are quite intolerant of heliotherapy. Results also vary according to the age of the patient. The older the child, the more readily a cure is obtained. Mediastinal adenopathy in infants is peculiarly severe and likely to spread, and infants are also very sensitive to sunlight, not infrequently showing a rise in temperature to 39° or 40°C. These patients should be allowed to move about during the sunlight exposures, which should not exceed two to two and a half hours a day, even after gradual training. Few children whose lungs have been definitely invaded by the tubercle bacillus derive benefit from heliotherapy; most of them are made worse.—*Traitement de l'adénopathie médiastine par l'héliothérapie, M. A. Dufourt, Presse Méd., August 25, 1919, No. 47, 470.*

Heliotherapy in the Prevention of Pulmonary Tuberculosis after Pleurisy.—The author calls attention to the marked value of sunlight treatment in preventing reinoculation of the system after a spontaneously curable attack of serofibrinous pleurisy. Heliotherapy is dangerous when once the lung has become involved, but if used earlier is of great prophylactic service. Having obtained good results from sunlight treatment in tuberculosis of other serous membranes, especially in peritonitis, sunlight baths were administered to adults or children convalescent from pleurisy. Several of these cases being now of six or seven years' standing, the author feels certain that the measure was of marked assistance in preventing secondary tuberculous manifestations both in the lungs and elsewhere. In applying the treatment to pleurisy convalescents, the whole body should be exposed to sunlight under careful medical supervision. The treatment should be kept up for several years, either continuously or intermittently. If a thorough "cure" is taken at the beginning, and subsequently a few months more of treatment undergone each year at some Southern or mountain resort—or even in urban districts where there is plenty of sunlight during the summer season—a patient who has had serofibrinous pleurisy may practically return to normal life during the intervals between "cures" without having to fear a later outbreak of lung tuberculosis.—*Héliothérapie préventive de l'éclosion de la tuberculose pulmonaire après les pleurésies sero-fibrineuses, I. M. Armand-Delille, Bull. d. l'Acad. d. Méd., October 7, 1919, lxxxii, No. 30, 156.*

Radium and Mesothorium in Vaginal Tuberculosis.—Radium and mesothorium destroy the lesion and the fibrinous change of the local tissues, and even after three years no reinfection has been observed to occur. The destruction of the superficial tissues occurs in the lesions as well as in the normal tissues. They are necrosed and slough off, while in the deeper tissues the degeneration of the connective tissues takes place until cells assume the embryonic state, from which reformation of the new tissues takes place. The author has been unable to demonstrate microscopically the action of these rays against the bacilli. It seems highly possible, however, that the infecting bacilli are so enveloped by the connective tissues that they are unable to maintain life. Amelioration of the general symptoms, restoration of the normal temperature, gain in body weight and appetite, increase of hemoglobin, go hand in hand with the local improvement.—*Action of Radium and Mesothorium on Vaginal Tuberculous Lesions, M. Shiraki, Japan Med. World, September 21, 1919, No. 301.*

Radiotherapy in Surgical Tuberculosis of Children.—Radiotherapy, in the perfected technic of the present day, is the treatment of election in surgical tuberculosis, more especially in the larger cities where the benefits of fresh air, sunshine, and proper food are often not available. The rapidity of resolution of glandular masses is in direct relation to the dose of the rays. Cold abscesses, the pus of caseous suppurating adenitis, should be evacuated by simple incision followed by intensive radiation. The dose and length of session of the X-ray treatment can be adapted to the intensity of the bacillary infection; high virulence calling for large doses, low virulence for small doses. It is possible to give daily treatments for fifteen days without producing a dermatitis, providing the rays are filtered and of short wave length. There is no advantage in intensive radiation of cutaneous tuberculosis in the stage of reparation as this destroys the new cells which form the cicatricial tissue. It is advisable to employ, in conjunction, general hygiene, ample nourishment, heliotherapy, fresh air, and the proper climate to defend the system against the tubercle bacillus, and to prevent the formation of new foci. Surgery, in most cases of surgical tuberculosis in children, should be looked upon as a method of secondary importance. Scientifically practised, rontgenotherapy either alone or associated with other phases of treatment is quite capable of curing the so called surgical affections.—*Radioterapia en las tuberculoses quirurgicas de la infancia, R. Espinola, Semana Med., October 30, 1919, xxvi, No. 44, 533.*

Radium in the Treatment of Tuberculous Adenitis.—During 1913–14 between twenty and thirty cases of tuberculous glands in all stages were treated with radium. In every case the swellings of even old sinuses disappeared; unless sinuses were present, no scars were left; no ulceration resulted. The skin in some cases was a little red for a few weeks but this always disappeared. The treatment was as follows: Fifteen milligrams of radium bromide is spread out on a flat circular applicator 1¼ inches in diameter, and mixed with a special varnish to keep it even; the applicator has a silver screen 1 mm. thick, and a piece of thin guttapercha tied over the whole. The applicator is strapped on over the tuberculous glands, ten hours being a suitable length of time for each application, that is 150 mgm. hours. It may be put on when the patient goes to bed and taken off in the morning. Two applications a week are usually given; a different set of glands can be treated each time until all are covered, and the course then started again. The treatment is continued until there are no further signs of trouble. Carious teeth and diseased adenoids and tonsils must be dealt with at the start. In very bad cases a few additional applications may be given three months later, but it is doubtful whether this is necessary if the first treatment is thorough. Recently the author has inspected many of the cases treated in 1913–14, and found no trace of any recurrence, nor has any recurrence been reported from the patients not inspected. Three cases are reported in detail.—*Radium in the Treatment of Tuberculous Adenitis, E. S. Molyneaux, Brit. M. J., November 29, 1919, No. 3074, 705.*

Hypertonic Salt Solution in Tuberculous Abscess.—Over 500 tuberculous abscesses in 245 soldiers, mostly prisoners returned from Austria, have been treated by the injection of sterilized hypertonic salt solution composed of magnesium chloride 2.5 grams, distilled water 100 cc., liquor formaldehyde, 0.5 cc. Magnesium chloride is used because of its stimulating action in the process of reconstruction of tissues, as demonstrated by Rosenblith and Delbet. The methods and indications for treatment are the same as in treatment with iodin solutions, but the abscess cavity should be emptied, washed out, and filled with salt solution every four days. This frequency of treatment is necessary because the quantity of lymph collected in the abscess cavity is so great as to produce a slight distention of the tissues and pain. The quantity of liquid left in the cavity varies from 10 to 40 cc. according to the capacity of the cavity and the degree of vascular action. This treatment reduced the healing period to a few months, which under treatment with iodin injections would normally extend over a year.—*Hypertonic Salt Solution in the Treatment of Tuberculous Abscess, L. Durante, Lancet, October 25, 1919, No. 5017, 735.*

Treatment of Tuberculous Abscess by Aspiration.—Several cases of tuberculous abscess are reported which were treated by aspiration. The general treatment was carried on under sanatorium conditions on conservative lines. For the aspiration, a stout needle with good bore was used; an oblique puncture was made, and inflamed areas avoided. Simple aspiration without injection of modifying fluid is often effective, and is to be preferred where the abscess formation can be arrested by this method. A great many diluents have been advocated,

and if they are to be used, the choice will depend largely upon the nature of the case and the personal experience and judgment of the surgeon. Solutions of ether, camphor and thymol have been found effective. Sinus formation is rare following aspiration, while it frequently follows incision. With early diagnosis and efficient continued aspiration, tuberculous abscesses are arrested sooner than by incision, and complications are prevented. In pulmonary cases, avoiding anesthesia gives an additional advantage.—*Treatment of Tuberculous Abscess by Aspiration, Z. P. Fernandez, Lancet, December 27, 1919, 1193.*

Treatment of Lupus Vulgaris.—A first essential of the successful treatment of lupus is the proper selection of cases. A quiescent isolated patch producing neither discomfort nor serious disfigurement does not call for treatment. A lupus patch in active evolution should have sedative treatment only, such as an application of lead and spirit lotion, or a varnish of ichthyol and water, or starch and boric poultices, frequently changed. Each case should be dealt with on its merits; many methods of treatment are available. Excision is the best procedure where there is an isolated patch, not too extensive, and so situated that excision will not cause undue disfigurement. Local application of caustic agents gives excellent results in some cases. The author prefers pyrogallic acid applied in a 5 to 10 per cent ointment. Applications should be renewed until pain becomes severe, then alternated with starch and boric acid poultices. Curetting a lupus patch frequently yields good results, but linear scarification is preferable, followed by the application of a simple ointment; the process of scarification should be repeated about every fourteen days. Freezing with solid carbon dioxide snow yields good results in lupus if the lesion is on the cheeks, when it is single and not too extensive, and when it is hypertrophic rather than atrophic. It should be used with caution in elderly people and in poorly nourished slum children. On account of the danger of epithelioma, the X-ray should be used with caution in lupus. The author prefers a third of a pastille dose through felt fortnightly, rarely carried further than two full pastille doses in all. The ultraviolet ray treatment, using the Kromayer lamp, is preferable, and as a rule gives excellent results, even in cases that have proved resistant to other methods. A diffuse radiation is best; children may be given seven and a half minutes exposures and adults ten minutes. The author has also used an electric lamp with electrodes of pure tungsten, the flame of which is rich in ultraviolet rays. For the destruction of scattered nodules of lupus, ionization with zinc salts is most efficient. Zinc chloride solution (2 per cent) or zinc sulphate (10 per cent) is used, and a current of two to three milliamperes per square centimeter of area. This method is also useful for lupus affecting the mucous membrane of the nose, but here a 2 per cent solution of zinc sulphate should be employed. The method par excellence for the treatment of lupus affecting the mucous membrane of nose or mouth is the electro-cautery heated to a dull red. The results with tuberculin in lupus are disappointing. The author has not tried salvarsan but from his observation of cases treated he believes that such benefit as results is only transient.—*The Treatment of Lupus Vulgaris, R. W. McKenna, Lancet, November 22, 1919, No. 5021, 917.*

Picric Brass in the Treatment of Lupus.—The use of brass paste and brass oil for the treatment of lupus and cutaneous tuberculosis generally results in an immediate improvement. But this healing process gradually slows down as the contact nodules are removed, the remaining deposits being more or less protected by the healthy surrounding tissue. Hence a number of experiments have been made to find an agent with a still greater power of destruction for tuberculous tissue that would not seriously injure healthy tissues. Attempts were made to secure this effect by varying the proportions of zinc and copper in the picric brass, but without results. Then a number of experiments were made with the nitro-phenyl series, and finally with the sulpho-phenyl series. Ultimately a saturated solution of picric in sulphanilic acid was found to fulfill the conditions. This preparation to which the name of sulphanilic-picric is given, is of a brown color and is fluid at ordinary temperatures. Its power to attack tuberculous tissue is evident on application, and in addition it increases the effectiveness of the picric-brass preparations, so that the two are used together. The results of observations for 12 months indicate that the combination of sulphanilic-picric and brass paste can penetrate and produce complete local destruction of tuberculous tissue without constitutional danger. The usual method of treatment of a case of lupus is to apply a few bro fomentations at two or three day intervals, then to apply the sulphanilic-picric to a small selected area, following a local anesthetic. About five to ten minutes is allowed

for the picric to penetrate. The area is then dressed with brass paste and strapped, or where a lesser action is desired, smeared over with picric brass and left exposed, or by the application of a bro foment, a mere painting with bro. In this way four degrees of destruction are available. Applications are made two or three times a week according to the case, with occasional rest periods. The sulphanilic-picric picks out the tuberculous tissue, staining it yellow. Healthy tissue is only very slightly affected. This preparation may be applied safely to the nasal and buccal mucous membrane, followed by an application of bro. It may also be used, but with caution in tuberculous invasion of the deeper sinuses of the neck.—*Picric Brass Preparations in the Treatment of Lupus, H. A. Ellis, Lancet, November 8, 1919, No. 5019, 827.*

Treatment of Tuberculous Cripples at Leasowe.—The hospital at Leasowe, completed in 1916 is within 300 yards of the sea, and fully exposed to the winds. It is built on the block-pavilion principle, each block consisting of two stories with twenty-four to thirty beds on each floor. The wards face due south, and are not heated. The Leasowe hospital is associated with the Liverpool Health Committee through the Liverpool Child's Welfare Association, and most of the patients are sent by this Association, priority being given to cases of early disease. Other health authorities have beds allotted to them, so that the hospital reaches a wide field. All cases of tuberculosis in children other than pulmonary are admitted, the majority being those with bone, articular or gland foci. Before being admitted to the ward the children are kept under observation for three weeks in single bed cubicles; this secures gradual acclimatization by using the folding doors, reduces the risk of introducing infection, and provides opportunity for investigating possible superadded pulmonary infection. In the wards the majority of the children become accustomed to the open air life and show marked improvement in appearance, weight and appetite. Nervous, excitable and febrile types require extra warmth in winter, and for these a special warm ward is provided. Exposure to the sun is practised whenever possible. The results are most marked in cases of tuberculous glands. Local treatment is carried out on conservative lines with the aim of preserving and restoring the diseased parts. Three hours and a half a day are devoted to school instruction. Eighty per cent of the cases admitted are discharged under the heading of "disease arrested," but the degree of cure naturally varies with the type of case. In the bony and articular types, treatment is prolonged in order that the disability may be overcome; in severe cases corrective operations are performed. The type of case admitted has improved since the opening of the hospital, with the result that average duration of the stay has been shortened and the degree of cure has risen.—*Treatment of the Tuberculous Cripple at the Hospital for Children, Leasowe, T. H. Martin, Brit. M. J., November 22, 1919, No. 3073, 664.*

Tuberculosis of Spine.—A new frame for tuberculosis of the spine is described and illustrated by G. N. Morrill. The disadvantages of the Whitman modification of the Bradford apparatus are: (1) the impossibility of holding the kyphos up, owing to the inevitable sagging of the canvas; (2) difficulty in ascertaining the position of the kyphos after the child is strapped into place, because of the thick padding underneath; (3) the necessarily tight apron holding the patient in position, with the result that not only is breathing made difficult, but the body is flattened and compressed to such a degree that normal development is impossible; (4) bad ventilation caused by direct bodily contact with the canvas cover and rubber sheeting; (5) the fact that the entire frame must be bent to the corrective angle, and (6) the great danger of genu recurvatum owing to the rigid fixation of the knees in a hyperextended position. The description calls for the seven illustrations which accompany the article to make it more readily understandable. The author claims it to be the most practicable device; he has employed it at the Lakeside and Rainbow hospitals in Cleveland in all his acute cases of dorsal and lumbar tuberculous spine.—*A New Frame for Tuberculosis of the Spine, G. N. Morrill, J. Am. M. Ass., January 10, 1920, lxxiv, No. 2, 99.*

Thoracoplastic in Pulmonary Tuberculosis.—Bull has done a thoracoplastic operation in 37 cases of pulmonary tuberculosis and tabulates the details and outcome in all. The mortality was 30 per cent in his earliest 11 cases but since then only 4 per cent and he ascribes this improvement to his practice of doing the operation at two sittings, with an interval of three or four weeks between them. Of the 33 who survived the operation, 7 died later from the progress of the tuberculosis, one surviving for four years; one succumbed to influenza, but 25 are still living, and 11 of these can be regarded as cured, with full earning

capacity; 7 still show symptoms, and in 7 the interval since the operation is too short for determination of the outcome, but most of them regard themselves as cured. A very favorable outcome was thus realized in over 33 per cent of 30 patients, including a number with an interval since of almost five years. When there is a cavity, he aids in the "collapse therapy" by implanting a piece of adipose tissue, cut to fit, from the abdominal wall. In the cases which showed little if any improvement, the operation was incomplete or the general health so poor that the thoracoplastic should not have been attempted. One died from intercurrent disease and in 7 the other lung became affected. Influenza also coöperated in rendering the outlook less favorable than might otherwise have been the case. The danger of the other lung's becoming diseased is the Damocles sword to fear. It is possible that adhesions may be responsible for the failures in certain cases; this is a question requiring further study. The thoracoplastic does not interfere with the use of the arm, nor disfigure, especially when fat implants were used.— *Videre erfaringer om behandlingen av lunge tuberkulose med extrapleural thorakoplastik, P. Bull, Norsk Mag. f. Laegevidensk, November, 1919, lxxx, No. 11, 1105.*

Operative Treatment of Advanced Pulmonary Tuberculosis.—Therapeutic pneumothorax is generally recognized as a valuable aid in the treatment of pulmonary tuberculosis, but in cases where adhesions have united the pulmonary to the costal pleura, no place can be found where the nitrogen or air can be successfully introduced. In such cases Friedrich and Brauer of Marburg University proposed the resection of the tenth to the second or first ribs followed by artificial mechanical compression of the thorax, to collapse the chest wall and produce the same result in such cases as pneumothorax in the more favorable cases. Sauerbruch modified the Brauer-Friedrich operation by doing it in two stages and under local novocaine anesthesia. The author has done extrathoracic thoracoplasty in advanced bronchietatics seven times in the last ten years, but has only recently had opportunity to operate on suitable patients with advanced pulmonary tuberculosis. One patient, a male aged twenty-six had suffered from tuberculosis of the left lung for seven years, and had been under treatment at various sanatoria. The rib resection operation was done in two stages following Sauerbruch's technic, the tenth to the sixth ribs being resected on November 18, 1918, the fifth to the second on December 5. The patient returned to Saranac, and at the last report had gained in weight and strength and "felt fine." Another case is mentioned in which the patient developed a high and irregular fever on the third day after the first stage of the operation; the second operation was not performed, and the patient died soon after his return to the sanatorium. Postmortem showed a pronounced disseminated tuberculosis in the left lung. The operation undoubtedly offers hope of great improvement and possible cure to some patients otherwise in a hopeless condition. Immediate results from the operation are seen in proliferation of the connective lung tissue, gradual carnification of the elastic lung tissue and reduction in size of cavities; reduction in cough and sputum, disappearance of bacilli, cessation of fever and night sweats and increase in weight.— *Operative Treatment of Advanced Pulmonary Tuberculosis, W. Meyer, Surg., Gynec. & Obstet., February, 1920, xxx, No. 2, 161.*

Endopleural Operations in Pulmonary Tuberculosis.—Failure to obtain good results with artificial pneumothorax in pulmonary tuberculosis is largely due to adhesions between lung and chest wall. In a certain proportion of cases these adhesions may be divided and complete collapse of the lung effected by the method of thoracoscopy and galvano-cauterization devised by Jacobaeus. The instruments employed are the thoracoscope, which embodies the principles of the cystoscope, being fitted with a small electric light and a prismatic mirror at one end, and a lens at the other; and a galvano-cautery 20 to 30 cm. long. The patient lies on his side; the chest wall is anesthetized, and the thoracoscope with its cannula is introduced. The course and character of the adhesions are studied, and the galvano-cautery passed through its cannula, and guided by the thoracoscope to the adhesion at the desired point. The current is turned on by pressure on a spring in the handle of the cautery, and the necessary degree of heat created; adhesions are often speedily destroyed, but in some instances the operation is not successful. The technique of the operation is not easy, and the generation of smoke is often embarrassing. There is danger of hemorrhage, but this is usually prevented by heating the cautery only to a dull glow. Occasionally it might happen that the adhesion contains a direct continuation of the pulmonary cavity; the danger is not great, and is rendered still more remote if adhesions are cauterized as far from the lung as possible. Cutaneous emphysema

and pleural effusion may follow the operation but soon disappear; a rise of temperature is usual, but lasts only a few days. Fistulae may develop in the track of the cannula but usually close without harm to the patient. Twenty-seven cases treated with artificial pneumothorax have been examined by the thoracoscope; cauterization was indicated in nine; five of these were greatly improved; and two others somewhat improved.—*Endopleural Operations in Pulmonary Tuberculosis, Jacobaeus's Method, W. Holmboe, Tubercle, October, 1919, 1, No. 1, 1.*

Respiratory Exercises.—Forcible breathing exercises as sometimes advised are likely to be harmful rather than beneficial in pulmonary tuberculosis. An increase in oxygen favors the growth of tubercle bacilli, and improvement in the pulmonary circulation may increase the absorption of their proteins. The tuberculous patient should never practice forcible breathing, but should breathe naturally, aiming to prolong the inspiratory phase and shorten the expiratory phase. By this method râles become quieter and cough may be controlled. In connection with these breathing exercises a good posture should be maintained, and static exercises —at rest or in bed—should be practised daily. A good diet is important. The addition of 100 grams of butter daily to the diet is a great aid in improving metabolism. —*Respiratory Gymnastics in Tuberculosis, H. C. Lane, N. York M. J., January 3, 1920, cxi, 21.*

Sugar Treatment of Tuberculosis.—Six cases of tuberculosis were treated with hypodermic injections of saccharose, 5 grams in 5 cc. sterile distilled water. Injections may be given daily or every other day. The treatment is entirely harmless and may be used as a routine measure in any institution treating tuberculous patients. In the cases reported the treatment had very little, if any, effect upon the progress of the fever; night sweats and expectoration ceased almost immediately The reduction of the cough was not in proportion to the reduction of the expectoration, and a dry and distressing cough might be present at first, but was more or less controlled later. There was a marked gain in weight and strength with an amelioration of the toxemia and its depressing effects.—*Sugar Treatment of Tuberculosis, A. Sterling, Med. Rec., December 6, 1919, xcvi,* 927.

Modern Treatment of Tuberculosis.—For some time it has been recognized that the three chief factors in the treatment of tuberculosis are rest, good food and fresh air. To these a fourth element must be added, which is contentment and happiness. To attain this the physician himself must be optimistic and able to inspire optimism in others. Patients must be instructed and aided by proper suggestive treatment to overcome their worries and control their emotions. Suitable forms of amusement and diversion should be provided through lectures, moving pictures, theatricals and good reading matter. The institutional air of the sanatorium should be as far as possible dispelled, and the sanatorium made to seem more like a great country estate, the home of a large and happy family. Individual symptoms should be properly treated but their importance should not be overemphasized. Tuberculin is of value only in selected cases and when employed by a physician trained in its use.—*Modern Treatment of Tuberculosis, R. C. Kirkwood, Med. Rec., December 20, 1919, xcvi, 1015.*

"Tubercle:" A New Journal.—A new monthly journal dealing with tuberculosis appeared in October, 1919 under the title, *Tubercle,* published in London. The editorial in the first number states that *Tubercle* will not be the organ of any existing society or group. It will for the present serve the purposes of keeping workers, however isolated, in touch with each other, and with promising fields of investigation and research and will work in friendly coöperation with every agency engaged in fighting tuberculosis. It will include original articles on all phases of tuberculosis, and a summary of current pathological, clinical and sociologic work. Though scientific accuracy is aimed at in all sections of the journal, clear and simple language will be used so that it will appeal not only to medical readers, but to all engaged in the campaign against tuberculosis, including public health committees, health visitors, nurses and social workers.—*Editorial, Tubercle, October, 1919, 1, No. 1, 14.*

Classification in Pulmonary Tuberculosis.—Various systems of classification for pulmonary tuberculosis have been proposed—the best known of which is the Turban-Gerhardt classification of stages 1, 2, and 3 according to the extent of the disease. The city of Edinburgh has employed a classification on this basis similar to that adopted by the sanatorium workers of North America. To this some indication of the general condition of the patient has been added by the author with a threefold division of (a) good; (b) moderate and (c) bad; (a) indicating few con-

stitutional signs, slight cough, bacilli absent or scanty, loss of weight about 6 pounds in as many months; rectal temperature not exceeding 99.2°F., no complications; (b) cough and sputum more pronounced; bacilli present; more than 6 pounds lost in six months; temperature from 99.2°F. to 100.5°F., slight complications; (c) general constitutional disturbance more marked than in b, grave tuberculous complications. By a combination of the symbols, such classifications may be made as stage 1A, 3A, 2B, 1C, etc. In some cases the lung lesion is so quiescent as to produce no constitutional disturbance, or may have been quiescent so long that it can properly be called healed. Then the case may be classified as stage 1 healed, stage 2 quiescent, etc. The great difficulty is in the classification of borderline cases, not far enough advanced to be assigned to class 1A. Cough not accounted for by any other condition, gradual but persistent loss of flesh amounting to 6 pounds in six months for adults, loss of energy, loss of appetite and deterioration of the blood with all other possible causes excluded, justify a diagnosis of tuberculosis, even in the absence of pulmonary signs. Among the working class in the city, such a group of symptoms may be associated with overwork, under-feeding and unhygienic conditions. Here, if cough is not a prominent feature, definite pulmonary changes, or occasional rises of temperature for some days would be necessary to make the diagnosis more than suspect. All cases of hemoptysis and of idiopathic pleural effusion should be classed as tuberculosis. The tuberculous syndrome, coupled with intimate and prolonged exposure to infection, especially in children, is definite evidence of tuberculosis. All such cases without pulmonary signs should be classified as stage A; where the syndrome is not complete, or where other factors confuse the diagnosis the classification should be stage A suspect, or simply suspect.—*The Necessity for a Uniform Standard of Classification in Pulmonary Tuberculosis, J. Guy, Tubercle, October, 1919, 1, No. 1, 9.*

Tuberculosis.—Notwithstanding the advances in later years in regard to tuberculosis and the apparent reduction in its mortality it is evident that the control of tuberculosis is far from what it should be. There is a factor in its persistence that has somehow escaped our notice, and it may well be, that it is the neglect of the social side which is responsible for our failure to bring about better results. The support of this view is found in the acknowledged experience that the onset of the disease is largely dependent on bad habits and manners of living enhancing the individual susceptibility. Probably too much emphasis has been laid on contagion and too little on the predisposing causes. The social factor is also important in determining the opportunity for early treatment, and too little attention is given to the improvement of living conditions and financial needs, important in many cases. Right living will prevent the persistence of tuberculosis. It may be, however, that certain climatic conditions increase the susceptibility in this country. Our severe winters and overheated dwellings and the possible danger in common bathrooms and washing facilities are perhaps overlooked. Craster lays down a city plan for tuberculosis control, including: A, control of infection by universal reporting by physicians, suitable hospitals and sanatoriums, day camps and laboratory facilities, anti-spitting laws and milk supervision; B, social progress through publicity, social insurance, antituberculosis societies and home visiting and relief; C, economic improvement by improved housing, industrial hygiene, open air schools, vocational training and employment bureaus; and D, associated activities, such as control of epidemics, convalescent houses, child hygiene and mental hygiene. Each of these points is taken up in detail. The reporting by physicians must be imperfect. If the number of reported cases equals one-third of the actual number existing we should have a pretty fair percentage of the notification. Duplicates should be accepted as the physician may have no knowledge of previous reporting. Follow-up questioning, laboratory reports, specialized health nurses and clinics, and hospitalization supported and supervised, at least, by the public to some extent, and instruction of the public to overcome prejudice, etc., are mentioned. Some patients will attend day camps but refuse other kinds of outdoor treatment. Laboratory facilities should be improved and milk supervision should be very strict. As regards social progress and relief there is much work to be done. There is no disease so closely connected with poverty and distress, and there is obvious need for instructed benevolence in these cases. Insanitary conditions and habits, however, are not confined to the poor. The effect of dusty trades may have been overestimated, as the evidence of mechanical injury to the lungs is insufficient. There are, however, occupations that predispose toward the disease, but much progress has been made here. As for the value of associated activities, child hygiene and conva-

lescent homes and mental hygiene, our latest health activity, will all tend to reduce abnormal conditions favoring the spread of disease.—*Tuberculosis: A City Plan, C. V. Craster, J. Am. M. Ass., January 31, 1920, lxxiv, No. 5, 302.*

Tuberculosis.—In the hubhub which has been stirred of late over venereal diseases, we are in danger of forgetting that tuberculosis is still with us and in about as great force as ever before. Moreover, instead of this disease being known in detail it seems much more of a mystery than ever. Twenty years ago its origin and the method of stamping it out seemed solved, but not so today. We are not even certain as to how the disease finds entrance to the body, the relationship of the bovine to the human bacillus has not been cleared up, and the cure of the patient is as uncertain as ever. At this time the résumé of a study of the subject made by the Medical Research Committee for National Health Insurance in Great Britain should be of much interest. It is pointed out in the introduction of the report that, in a previous study of the registrar general's returns for tuberculosis, it was discovered that there is not one form of the disease but two, and perhaps three types. One form attacks chiefly those between twenty and twenty-five years, a second kills most commonly between forty-five and fifty, and a third proves fatal between the ages of fifty-five and sixty. The existence of these types must be kept in mind and the prevalence in a community of one or another form, when studying the effects of climate or of occupation.

A study of various districts of the United Kingdom shows that the death rate differs in them, and that it differs at the different age periods. Changes have taken place in the past fifty years in the proportion of deaths from the different types. These changes are especially marked in the northern countries. The chief seats of early phthisis are the seaboard and agricultural counties, there being in the Shetland Island, none but the early form. The death rates for males and females are absolutely distinctive, the death rate curves for females being more uniform and the maximum rate falling in the second period or around the ages from thirty to thirty-five. There is three times as much phthisis of old age among males. Seamen have a high tuberculosis rate and agricultural laborers a low rate. File cutters, tool manufacturers, stone quarrymen, masons, brick layers, and all miners except of iron and coal, show higher death rates than the occupied males at large. Tin miners have an especially high rate, but in all these occupations the type of disease follows the type of the locality and is not influenced by the occupation.

The report concludes that since tuberculosis is not a single disease but a group of diseases, like the typhoid-paratyphoid group, this must be considered in attempts at serum treatment. Tuberculin made from the bacillus of one type would not be expected to influence another type of the disease. The predominant type differs in different regions. The young adult type, like scarlet fever, is not affected by environment. There is as much of this form in healthy as in unhealthy homes. In scarlet fever the amount of disease seems to depend on the amount of milk consumed, and we are left to infer that milk may have to do with this form of tuberculosis.

Viewing the subject historically the report concludes that a long drawn out epidemic of the young adult type of the disease has been going on which reached its climax about fifty years ago, while the middle age type reached a maximum figure a hundred years ago. The rise in the mean age of death from the disease does not seem to be due to an increase of immunity but to a decline of rate of the younger form. The fall of the death rate for both the early and the later types of the disease began so far back, and has been so steady, that there is no doubt that a considerable part of the decline of phthisis in recent years is in line with the biological properties of diseases in general, and has little to do with hygienic conditions.—*Editorial Note, N. York M. J., January 31, 1920, cxi, No. 5, 204.*

Concerning Tuberculosis.—The prevalence of tuberculosis in Europe has increased very considerably as a consequence of the war, of which it is one of the saddest aftermaths. In Great Britain the increase of mortality from the disease is said to reach 12 per cent. In France the increase has been no doubt even greater, and on the Continent generally, as was only to be expected, the incidence of and mortality from tuberculosis have been augmented. Before the war steps had been taken to arrange for the carrying on of a much more vigorous campaign against the malady in America and Great Britain than had been waged formerly, but in the latter country the war had the effect of almost completely stopping these plans. At the British Tuberculosis Congress, held in 1913, it was thought and said that a crusade conducted on certain lines which had been mapped out would result, if not in the extinction of tuberculosis, at least in a most satisfactory

curtailment of its powers for evil. It was thought that knowledge of the disease was such that it only required to be put into practice thoroughly to achieve the end desired. The war, however, appears to have shown that these hopes were premature.

The experience of France demonstrated the fact that a large proportion of its population suffered from latent tuberculosis, which the stress and strain on the nervous system and physical powers brought about by the war rendered active. According to Colonel Rist not fewer than 80,000 men were discharged from the French army because of tuberculosis. It is stated that at the beginning of the war, owing to the urgent need for men, the examinations were hasty, and many tuberculous subjects were passed into the army. The result was inevitably widespread infection to such an extent that the French Government in 1917 accepted the American offer of help through the Rockefeller Institute. The final outcome of the efforts of the American physicians and nurses will not be evident for some time to come, but up to the present time the work has afforded grounds for hope.

It is recognized in Great Britain that while in many respects its tuberculosis specialists have been pioneers in treatment, at the same time they have been too conservative, too narrow in their views, in fact, and afraid to launch out in the same way and to the same degree as the Americans. For example, Prof. William C. White of Pittsburgh, in an address delivered before the conference of the British Association for the Prevention of Tuberculosis, spoke of the work which has been and is being done by the tuberculosis nurse in America. He estimated at 60 per cent the nurse's share of all the work done against tuberculosis in America. Sir Arthur Stanley, chairman of the Joint War Committee of the British Red Cross Society and the Order of St. John, speaking at the same meeting, announced that the Red Cross would find funds for antituberculosis work, and in addition a very large number of women would gladly give their services to the same cause

Dr. Christopher Addison, the Minister of Health, who gave the opening address at the Tuberculosis Conference, laid most insistence on adequate, sanitary and comfortable houses as a means of combating tuberculosis. The sanatorium did not appear to be regarded with so much favor as formerly, although, as one speaker remarked, it was not the fault of the sanatorium, but was due to the fact it was not usually employed properly. The consensus of opinion expressed by the speakers was that in order to fight tuberculosis successfully coördination is required, and to obtain such coördinated effort the masses must be educated in public health matters. It may be noted that at the conference it was acknowledged that American organization for dealing with tuberculosis was the most effective.—*Editorial, Med. Rec., December 20, 1919, xcvi, No. 25, 1020.*

Tuberculosis Problems in the New Age.—The war has brought out the fact that the former conception of the proper means to combat tuberculosis was far too narrow. The fault in public health work has been that it has not penetrated to the mass of the population. In bringing skilled knowledge into practice in the every day life of working class households there is a great opening for a band of trained workers such as the public health nurses in America. No one regards the sanatorium as all-important in antituberculosis work; it is merely a link—a very useful one—in the administrative chain. Dr. Addison has named three factors of paramount importance—housing, an educational campaign, and research. The first and third of these depend for their realization on the expenditure of money, the second is largely a question of personal effort. The lesson of the war will not have been in vain if it leads to a proper appreciation of the value of coordinated action in pursuit of national health, and particularly in the elimination of tuberculosis.—*Tuberculosis Problems in the New Age, Editorial, Lancet, October 25, 1919, No. 5017, 743.*

American Red Cross Tuberculosis Commissions.—The achievement of the American Red Cross Commissions in checking tuberculosis in Italy and France gives evidence of the spirit of friendly criticism and coöperation by which it was made possible. The work of investigation in Italy was carried on in three main fields,—school hygiene, child labor, and housing. The assistance offered by the Italian School Hygiene Association in allowing visiting and close inspection of existing conditions and in giving the American Commission full access to the rules and regulations already in force greatly aided the Red Cross workers in making a thorough and an intelligent study of the situation. It is plain that Italy needs to introduce and enforce some means of teaching her people even the most elementary rules of hygiene; suggestions for improving the present system have been made by the American Commission and have met with the approval of

the Italian health authorities. The report of the Commission states that already measures have been adopted for emphasizing the prevention rather than the cure of tuberculosis; legislation has been formulated which aims to protect infant welfare, maintain during school life a regard for hygienic conditions, and directs the employment of young boys and girls so that they may not be forced to accept work which will be detrimental to their future health.

In France, also, a Commission investigated the local conditions, and, by the aid of grants of money, organized a chain of health centers for the provision of special treatment. Here, too, the importance of training school children to observe the fundamental principles was emphasized, and carried out by the coöperation of children, parents, and teachers. Lists were made of hygienic rules to be followed, such as personal cleanliness, plenty of fresh air at night, and daily exercise—a series of tasks in which the children manifested a real pride in performing faithfully. Perhaps one of the most far-reaching results of the work of the Commission in France was the establishment of a system whereby local practitioners are to carry out the work which has been outlined in some parts of the country by their American colleagues.

That the criticism and suggestions offered by the American Commission to health authorities in Italy and France have been received gratefully by these countries and have been made in some instances the basis of future reform, indicates the value of international coöperation in matters pertaining to the investigation and prevention of disease. It is to be hoped that the efforts of the American Red Cross Tuberculosis Commissions may prove to be only the promise of success in carrying out even more extensive activities which we may anticipate for the future.—*Editorial, Boston M. & S. J., October 30, 1919, clxxxi, 545.*

The Prevention and Arrest of Tuberculosis in Canada.—Dr. George Porter, secretary of the Canadian Association for the Prevention of Tuberculosis, contributed some interesting data regarding the control of tuberculosis in Canada. Apart from an annual subsidy to this association and quarantine at ocean ports, the federal government has not taken any part in the control of this disease, leaving all such matters of public health to the nine provinces. Recently, however, on account of returned tuberculous soldiers, the government has taken over the care of these; and now that Canada has a well organized Department of Public Health, a nation-wide campaign may be expected against this disease. Twenty years ago there was but 1 small institution of this character in Canada. Ten years afterward 6 were established. At the present time there are 40 sanatoria in addition to those set apart for soldiers. Only 30 patients could be accommodated twenty years ago. In ten years there were 350 beds. Now Canada has 3500 beds. More than $1,000,000 are spent annually in the maintenance of civilian institutions; and the total value of these institutions is more than $3,000,000. The National Sanatorium was the pioneer organization, which began work in 1906. This association has now accommodation for 800 patients in Muskoka and Weston, near Toronto. The province of Nova Scotia was the first to establish a provincial sanatorium, and the city of Hamilton, Ontario, was the first to establish a county or municipal institution of this character. The province of Ontario, while not conducting an institution of its own, allows one-fifth of the original cost of the building up to $5000 and $3.50 a week for each patient for maintenance, and the municipality from $4.90 to $7.00 per week. Some provinces allow more, some less, while two of them have done practically nothing. The incidence of tuberculosis in the Canadian Army is less than that in the civilian male population of military age. The number of returned tuberculous soldiers up to July 1, 1918, was about 4000, with at that time about 1500 abroad to be returned to Canada which at the present time has been accomplished. As there were 50,869 Canadians killed in action or dying from wounds, Canada has had nearly as many civilian deaths from tuberculosis during the war period as fatalities among Canadian soldiers.—*Editorial Note, N. York M. J., February 28, 1920, cxi, 379.*

The Tuberculosis Death Rate.—The report of the executive committee of the National Tuberculosis Association points out that the annual number of deaths from tuberculosis is 150,000. This means that this disease annually sacrifices more lives than America lost in the war. The examinations under the draft law resulted in the rejection of 100,000 young men because of tuberculosis, many of whom had no suspicion that they had the disease. There are over one million known cases of tuberculosis in the United States, and the result of the draft examinations would indicate that there are double that number of unsuspected cases. If taken in time, there is no serious disease quite so amenable to treatment as tuberculosis. Hence it is impor-

tant that patients should be willing to submit to proper treatment in the earliest stages, and that physicians should be able and willing to diagnose the disease from the early symptoms. A persistently rapid pulse should be regarded with suspicion; if, with this there is loss of weight and a history of contact with tuberculous patients, it is almost sufficient to justify the diagnosis of tuberculosis. If there is a slight hacking cough, though without expectoration, the suspicion is amply confirmed; while any local lung symptom, such as a lengthening of expiration at one of the apices, gives proof positive of a tuberculous infection of the lungs. If when those symptoms are present the patient can be made to gain weight, and to alter his mode of life so as to spend more time in the open air there is an excellent chance of making the case one in which the presence of tuberculosis will be absolutely demonstrated only after death. Waiting until there is a definite febrile reaction, or until tubercle bacilli are found in the sputum, very often means a long road to recovery, and serious impairment of vitality. When these facts are explained to a patient with the incipient symptoms, it will encourage rather than discourage him, and make him anxious to persist in the treatment that will prevent more serious developments.— *The Tuberculosis Death Rate, Editorial, N. York, M. J., October 11, 1919, cx, No. 15, 621.*

International Standards of Public Health Work.—In order to fix a basis for international public health work, we must first determine the essentials and their relative value in relation to the budget available; secondly we must establish the working units; and finally these units must be correlated into a complete whole. Tuberculosis has always had a prominent place in the formulation of public health programs, because we have no specific cure for the disease, and must rely upon organization and coördinated effort for its control. In the past too much emphasis has been laid upon details and special measures for the control of tuberculosis. What is necessary is the modification of equipment to meet the needs of each locality, and to determine this a careful statistical study of every district must be made, and the available funds ascertained. Because approximately 85 per cent of tuberculosis cases must be cared for in the home, the importance of the public health nurse is great. The nurse and the amount of territory and the number of people whom she can adequately handle should constitute the working unit. To these units, other necessary equipment can be added—dispensaries, laboratories, hospitals for advanced cases, sanatoriums, etc. Coöperation should also be established with organizations dealing with related problems—child welfare, housing, etc. The function of the national government is to study, correlate, suggest, stimulate and subsidize the work of the local units so that standards may be uniform. And uniform standards must also be set up throughout the world by the united effort of Great Britain, America, France and Italy.—*International Standards of Public Health Work, W. C. White, Lancet, October 25, 1919, No. 5017, 719.*

Tuberculosis Experience of Metropolitan Life.—Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, draws the following conclusions from a study of the mortality experience from tuberculosis in the Industrial Department of the company in 1918: (1) The death-rate from tuberculosis (all forms) in 1918 continued to decline, the rate being 187.4 as compared with 188.9 in 1917. There has been a decrease in the annual death-rate, without exception, since 1911, when the rate was 224.6 per 100,000. (2) The reductions in the rate since 1916 have been much smaller than in the preceding years; 1.3 per 100,000 in 1917 and 1.5 per 100,000 in 1918 as compared with 11.7 per 100,000 in 1912. (3) Since 1911, the total reduction in the tuberculosis death-rate has been 37.2 per 100,000, or 16.5 per cent of the 1911 rate. One death in every six from tuberculosis has been either prevented entirely or delayed. This is equivalent to the saving of more than one-third of a life from tuberculosis alone among each 1000 persons insured in the Industrial Department. (4) The conditions with reference to tuberculosis of the lungs are identical with those for tuberculosis (all forms) described above. (5) The improvement in 1918 as compared with 1917 would have been much greater but for the last three months of the year. In the first nine months, the 1918 rate was seven per 100,000 lower than the 1917 rate; but, for the last three months, the rate was 16.8 per 100,000 higher than the 1917 rate. The tuberculosis death-rate usually drops considerably in the last quarter of the year; but, in 1918, probably because of the influenza epidemic there was next to no decline. (6) Exactly similar conditions are found in the population figures for both the State and City of New York. The 1918 tuberculosis figures were either identical or somewhat lower than those for 1917. In the last quarter of the year, the rate was somewhat higher in

1918 than in 1917. In the first nine months, the 1918 rate was considerably better than the 1917 rate. This is an important point because there had been some fear that war conditions would result in an increase in the death-rate from tuberculosis. Apparently this has not occurred in the population of New York City or of New York State, or among the Industrial policy-holders of the Metropolitan. (7) Considered by *age period*, the figures show that the death-rate for tuberculosis of the lungs at ages under 15 remained stationary in 1918 as compared with 1917; went up for the period 15 to 24; declined from age 25 up to 55 and remained stationary from 55 to 65. (8) The white females *alone* show increases in the rate at the ages of adult life. The white males, colored males and colored females all show reductions between 25 and 55. (9) All the four groups, i.e., white males, white females, colored males and colored females, show increases in the rate at the age period 15 to 24 years. This is very clear, but the reason for the increase is difficult to understand. The number of deaths from tuberculosis (all forms) in 1918 was 21,827. If the same rate as in 1911 had prevailed, the number of deaths would have been 26,130.—*Leaflet, distributed by Metropolitan Life Insurance Co., Industrial Tuberculosis Experience in 1918.*

Tuberculosis in New York City. Quarters Ending December 31, 1918 and 1919.

		MANHATTAN	BRONX	BROOKLYN	QUEENS	RICHMOND	CITY
Population	1918	2,731,731	622,555	2,023,170	392,966	101,721	5,872,143
	1919	2,780,485	645,894	2,070,539	406,236	103,640	6,006,794
New cases	1918	1,188	317	588	117	23	2,233
	1919	2,103	508	907	239	37	3,794
Total cases in register	1918	18,903	3,447	7,792	1,654	252	32,048
	1919	17,449	3,583	7,212	1,525	267	30,036
New patients examined at clinic	1918	1,682	552	1,717	130	10	4,091
	1919	1,981	442	1,230	156	25	3,834
Cases under supervision	1918	1,708	1,997	5,579	54	11	9,349
	1919	130	143	368	8	5	654
Voluntary renovations	1918	537	87	585	78	3	1,290
	1919	386	73	221	97	42	819
Sputum examined	1918	5,832	1,541	2,242	419	85	10,119
	1919	5,790	1,588	2,766	484	98	10,726
Positive sputums	1918	1,251	297	605	100	21	2,274
	1919	1,133	314	515	102	14	2,078
Deaths	1918	1,041	238	683	151	59	2,172
	1919	693	161	453	83	28	1,418
Death rate per 1,000 of population	1918	1.51	1.52	1.34	1.53	2.30	1.47
	1919	0.99	0.99	0.87	0.81	1.07	0.94
Deaths all forms Tuberculosis	1918	1,176	265	763	165	64	2,433
	1919	794	183	518	93	32	1,620
Death rate, all forms	1918	1.71	1.69	1.50	1.67	2.50	1.64
	1919	1.13	1.12	0.99	0.91	1.23	1.07

—*Weekly Bull. Dpt. Health, N. Y. City, March 27, 1920, ix*, 101.

Tuberculosis Statistics for 1918.—Tuberculosis in its various forms caused 122,040 deaths, of which 108,365 were due to tuberculosis of the lungs. The death rate from all forms of tuberculosis was 149.1 per 100,000 and from tuberculosis of the lungs, 132.4. The rate from tuberculosis of all forms declined continuously from 200.7 per 100,000 in 1904 to 141.6 in 1916, the decrease amounting to nearly 30

per cent; but for 1917 and 1918 increases are shown, the 1918 rate being somewhat higher than the rate for 1917, when it was 146.4. Until 1912 more deaths were due to tuberculosis than to any other single cause, but in that year and during the period 1914-1918 the mortality from tuberculosis was less than that from heart diseases.—*Principal Causes of Death in United States Registration Area, Publ. Health Rep., February 13, 1920, xxxv, No. 7, 34.*

Conjugal Tuberculosis.—Students of tuberculosis have repeatedly called attention to the relative infrequency of conjugal infection in tuberculosis. In the case of tuberculosis, numerous investigators have noted that phthisis in both husband and wife is very rare, despite the fact that they probably come into more intimate contact than even father and child.

Following a summary of conjugal tuberculosis, Fishberg in the latest edition of his work *Pulmonary Tuberculosis* comes to the following conclusions: (1) Tuberculous infection can only occur once; and (2) phthisis evolves only in persons who are for one reason or another predisposed to the disease. Inasmuch as the nonphthisical consort has already been infected with tubercle bacilli during childhood, all new opportunities for reinfection by cohabitation with a consumptive consort are of no avail to produce phthisis. It is his or her constitution that determines whether consumption will develop and not the opportunities for reinfection.

The correctness of the view expressed above has recently been challenged. In an interesting article entitled "Conjugal Tuberculosis," published in the *Lancet* (October 4, 1919), E. Ward, M.D. tuberculosis officer for South Devon, gives the results of an inquiry extending over a period of five years, and relating to 156 cases in which the mate of a tuberculous husband or wife was examined. The results of these examinations are tabulated as follows:

Chart I. Results of examination of contacts of tuberculous patients, husband and wife

	NUMBER EXAMINED	TUBERCULOUS	SUSPECT	NEGATIVE	PERCENTAGES		
					Tuberculous	Suspect	Negative
Wives (husband first notified)..	120	66	12	42	55	10	35
Husbands (wife first notified)..	36	25	4	7	69	11	20
Total.....	156	91	16	49	58	10	32

"In deciding to which category a contact belongs, the examination was not made so punctiliously that few could escape the net; two or more definite indications were required. Crepitations at one apex alone would not be called tuberculosis, but crepitations at one apex, plus a history of hemoptysis, would be so called. Similarly dulness and crepitations at one apex would be classed as tuberculosis; and also failing health, hemoptysis, and dulness, with crepitations, at one base. If the signs found were suggestive, but not sufficientiy conclusive, the contact was classed as suspect. Comparing now the results of examining contacts other than husband and wife; out of 1067 examined, 219 were tuberculous, 284 suspect, and 564 negative; or, roughly, 20 per cent, 27 per cent, and 53 per cent (Chart II). Taking as a further control the contacts of cases seen for an opinion and diagnosed nontuberculous, either at the time of the first visit or later, out of 81 examined, 4 are found to be tuberculous, 7 suspect, and 70 negative; or in percentages, 5 per cent, 8 per cent, and 87 per cent (Chart III). Cases of definite surgical tuberculosis, and their contacts, are included, but the number of such cases was relatively small."

Chart II. Results of examination of contacts of tuberculous patients other than husband or wife

Number examined		1,067
Tuberculous	219	
Suspect	284	
Negative	564	
Percentages:		
Tuberculous		20
Suspect		27
Negative		53

Chart III. Results of examination of contacts of nontuberculous patients, including husband or wife

Number examined		81
Tuberculous	4	
Suspect	7	
Negative	70	
Percentages:		
Tuberculous		5
Suspect		8
Negative		87

After discussing the results of this investigation, the author concludes as follows: Well knowing the difficulties in the way of any statistical investigation such as this, I make no claim that the present contribution is a final settlement of the question, but am sure that this important subject should be reconsidered in the light of the greatly increased material now available. On the opinion generally held regarding infection the success or failure of all our antituberculosis work depends. Either we take the fatalistic view of a universal infection and family predisposition (I almost wrote predestination), and therefore direct our efforts to help the tuberculous individual, or we look upon the disease as infectious, and take

means to prevent it by isolating highly infective cases, there being as yet no method of universal vaccination against tuberculosis. I estimate that over 50 per cent of all cases seen are due to direct personal infection, and am therefore a strong advocate of preventive measures.

With the large number of well-organized tuberculosis clinics at work in this country, it should not be difficult to obtain a large amount of accurate statistical information to determine which view represents the true condition. Further studies along this line are certainly desirable, for the question at issue involves one of the most fundamental points in the whole tuberculosis campaign.—*Publ. Health Rep., January 30, 1920, xxxv, No. 5, 219.*

Bovine Tuberculosis.—An address by F. W. Harding, secretary of the American Short Horn Breeders' Association, devoted chiefly to discussion of the tuberculosis problem. The beef cattle breeders strongly favor nationalization of the subject and the adoption of the most uniform regulations and methods of dealing with tuberculosis that can possibly be agreed upon between the states and the national government. He pointed out many of the marked differences and glaring inconsistencies in the present varying regulations by different states. He particularly criticises the recommendation that animals be tested within thirty days of the time they are shipped into certain states, stating that it did not give the breeder of pure-bred cattle time to get out his catalogue, hold a sale and dispose of his cattle after a test was made. He also opposed the sixty-day retest, stating that this should be left to the honesty and integrity of the breeders. He strongly urged that show cattle being taken from one state fair to another be not required to comply with the regulations for the shipment of cattle into those states. He dwelt at some length upon the value of the tuberculin test in certain cases, and quoted Dr. Alexander of the University of Wisconsin as having said he did not believe that valuable breeding animals should be condemned for tuberculosis on the result of one test.

He deplored the cost of the tuberculin test as being a hindrance to the trade in pure-bred live stock, stating that many young bulls were sold for improving the quality of beef cattle at a price around $200 and that at the present it cost about $20 to test such a bull before shipping and an additional $20 for the 60-day retest, and that $40 for the testing and only $200 for breeding, rearing, feeding and selling the bull was not fair. He strongly favored the segregation of reacting animals and the retention of those that were good breeders. He spoke favorably of the accredited herd plan, but stated that only a beginning had been made and he did not see how it would be possible to apply it to all the herds in the country, stating that there are 35,000 herds of registered short horn cattle alone, and that it would appear it would take as great many years to get this number of herds on the accredited list. He personally would rather buy cattle from a herd that had passed a successful test within thirty days than to get them from an accredited herd that had not been tested for approximately a year. Harm was being done by giving some animals enormous doses of tuberculin and such doses are unnecessary. He assured the live stock sanitarians and practising veterinarians present of the fullest coöperation of the beef cattle breeders in the continuance of any reasonable measures for the control of tuberculosis.

Senator J. M. Hackney of Minnesota, Secretary of the American Holstein-Friesian Association, made one of the most excellent addresses of the whole meeting. Like Secretary Harding, this discussion was devoted almost exclusively to the tuberculosis problem. He stated that in his locality there were plenty of veterinarians who were well advanced in horse diseases, but that they found it difficult to procure men who had the necessary experience and ability in handling the diseases of cattle, especially the diseases of dairy cattle. He was loudly applauded when he said: "Any man who puts up an animal for sale either at a private sale or at an auction, who knows that that animal is tuberculous should be indicted and convicted as surely and as quickly as though he had committed murder." He told of an interesting experience that he had while a member of the Minnesota Senate. A bill had been introduced in the state legislature to prohibit the tuberculin test. A majority of the members of the legislature seemed to favor it. He obtained permission to test a herd and found 19 reacting animals. These were sent to the St. Paul yards and slaughtered and members of the legislature invited to witness the autopsies. Not all of them attended. He obtained diseased organs of the animals, took them to the State House and put them on display in the corridors where the members could not help but see them. Instead of prohibiting the tuberculin test in Minnesota, the legislature enacted laws strengthening its application.

Senator Hackney's experience with the Bang method or the segregation of affected animals was unsatisfactory. He favored,

however, permitting herds on the accredited list to use a reacting sire and thought that the tuberculosis free accredited plan should be changed to permit this. He made a strong plea for the recognition and use of certified milk and deplored the fact that many practitioners of human medicine did not seem to realize its superiority over a pasteurized product.—*Twenty-third Annual Meeting of the U. S. Live Stock Sanitary Association, Am. J. Vet. Med., March, 1920, xv, No. 3, 105.*

Tuberculosis Eradication in Stock.—A conference on tuberculosis eradication was held at Chicago October 6, 7, and 8, 1919, under the auspices of the United States Bureau of Animal Industry. About forty states were represented by the State Veterinarian or State Live Stock Sanitary Commissioner or both. The discussions revealed a wide difference of conditions and problems, but a rapidly increasing interest among farmers and stockmen in the question of tuberculosis, and a constantly growing demand for scientific tests. The merits of the various tuberculin tests were carefully discussed. The subcutaneous test is most widely used, but the intracutaneous and conjunctival tests also are employed. The intracutaneous test is especially useful in testing range cattle and others unaccustomed to handling; it is also useful in very hot or cold weather, when atmospheric conditions affect the temperature readings on which the diagnosis by the subcutaneous test depends. The eye test is used in combination with other tests or as supplementary in suspicious cases. When used in combination the tests appear to be an almost unfailing means of diagnosing the disease. The accredited herd plan is very generally favored, under which Federal and State authorities grant a certificate to owners of herds found to be free from tuberculosis and maintained in a prescribed manner. The eradication of tuberculosis in cattle will practically solve the question of controlling the disease in swine, as the evidence shows that swine are infected chiefly from cattle, either by following them in feed lots or pastures, by being fed on tuberculous dairy products, or by eating tuberculous carcasses. By means of a practical and simple marker on hogs for slaughter, a shipment can be traced back to the farm whence it came if the meat is found diseased, and the infection can be stamped out at its source. The tendency in tuberculin testing is away from the use of large doses. Many of the delegates believed the use of more than 10 cc. of tuberculin was unwise. Dr. Mohler's opening address dealt with the problems to be discussed, especially the accredited herd plan.—*Tuberculosis Eradication Conference, Editorial, Am. J. Vet. Med., November, 1919, xiv, No. 11, 555.*

Prophylaxis of Bovine Tuberculosis.—To sweep away all indemnities, etc., for tuberculous cattle, and place the loss squarely on the shoulders of the proprietor, is the only effectual way to stamp out bovine tuberculosis. This makes the loss from it so excessive that the proprietors will be forced to take steps to protect their herds against it. According to the present measures, the proprietors have comparatively little personal interest in stamping out the infection. When they find that unless they do this their losses will be excessive, a new order of things will be inaugurated. Three things are necessary for this: (1) The nullification of the sale of any animal found to be tuberculous. The animal to be returned immediately to the vendor; the latter to pay the expenses of transportation and refund the purchase money. (2) The public health service to investigate the herd from which the tuberculous animal came, and brand all tuberculous cattle found destined for any purpose except slaughtering. The vendor to stand the partial or total loss when meat is confiscated on account of tuberculous lesions. (3) No indemnity to be paid to the owner of the cattle except when an animal is ordered to be slaughtered on account of tuberculosis of the mammary glands, or when a mistake has been made in the diagnosis.

With these regulations in force, the tuberculous animal would have to be kept at home, and hence could not start new foci. It would have very little commercial value, as it could not be sold for anything except butchering, and not even for this if the disease is far advanced. The financial loss would be so great that the proprietors would spare no pains to protect themselves. This would transfer the fight against bovine tuberculosis from the authorities to private interests, instead of the latter hampering and seeking to circumvent the authorities in the task. The proprietor would not have to make any declaration, and would not be molested by any one so long as he kept his tuberculous cattle at home. He can call on authorities to help him weed out the tuberculous animals, and these he can keep separate from the others and send to the slaughter-house at his convenience, while the rest of his herd is kept safe from infection with tuberculosis. He can take his own time and means to eradicate tuberculosis from his herd, and none of his tuberculous cattle need be

branded if he does not attempt to sell them for any purpose except butchering. This prophylaxis based on private interests will act everywhere throughout the country at once, and will be kept up until bovine tuberculosis has disappeared. Lignières urges legislators to pass a law nullifying the sale of a tuberculous animal for any purpose except butchering, and providing for branding as described above.—*Contribution à la prophylaxie générale de la tuberculose bovine, J. Lignières, Bull. d. l'Acad. d. Med. December 23, 1919, lxxxii, No. 41, 505.*

Colonization of Tuberculous Soldiers and Families.—The tuberculous have an economic value, and this value must be properly developed. This can best be done by colonization under medical supervision. Functional ability must first be developed, and this is primarily a medical problem; technical training must be given as soon as physical conditions permit, and, properly supervised, is an important aid in the development of functional ability. Functional perfection and technical ability properly developed finally lead to competing ability—the ability to return to industry under normal industrial conditions. At least two years under supervision is necessary after the sanatorium treatment is completed, to reach competing ability. Families should be included in the supervised colony, as this preserves normal human relations and standards, and under medical supervision is entirely safe for the children, tending to develop immunity through exposure to limited infection. Every occupation is open to the tuberculous, and the colony should be a school to train the man for the work for which he is best fitted. Colonies should not be isolated, but should be near large centers; they should be governed by the inhabitants but subject to medical and sanitary supervision. The Federal Board for Vocational Education has under its control a number of discharged soldiers with manifest tuberculosis. When, under proper treatment, the patients reach the quiescent stage with negative sputa, they are admitted to training in certain schools, but under medical supervision of the Public Health Service which supplies a full time medical officer and nurse where twenty-five or more are grouped in one institution. The number of studies, hours of study and rest, exercise, diet, living quarters and social life are carefully regulated. So far 275 patients are receiving training in three state universities, two state agricultural colleges, five business colleges and other schools, under expert medical supervision.—*Government Colonization of the Tuberculous Soldiers and their Families under Medical Supervision, W. H. Watterson, Chicago Med. Rec., December, 1919, xli, No. 12, 462.*

Methods of Infection.—The main channel of infection in respiratory diseases has confused scientific men for a long time, especially as regards pulmonary tuberculosis. In addition to the various theories of infection, the theory of latency in the lymph glands has arisen. The consideration of the eye as a channel of infection has been entirely neglected until Maxcy demonstrated that it might be one of the least protected regions of the body, by showing that *B. prodigiosus* introduced into the conjunctival sac can be recovered from the nose in five minutes, from the throat in fifteen minutes, and from the stool in twenty-four hours. A number of points of direct interest in the problem of the eye as an avenue of infection were left unsettled by Maxcy. These factors seemed worthy of further investigation: Whether the microorganisms really ever reached the respiratory tract below the epiglottis and vocal cords and how long they remained there; what course the microörganisms followed after instillation in either eye; how long they persisted in the nose, pharynx or larynx (the studies reported by Maxcy were of only thirty minutes' duration), and since it has been suggested, though not authentically demonstrated, that microorganisms can enter the lungs by way of the intestinal tract in experimental animals, whether this could occur in man. It was with a view to corroborating and elaborating the work initiated by Maxcy that the experiments to be described were performed. The experiments were carried out on tuberculous patients, capable of expectorating sputum. The time factor after instillation, the course followed, the distribution after ingestion were all tested, *B. prodigiosus* being used, and the authors conclude that the eye must be considered as one of the most important portals of respiratory infection. Although the greater part of infectious material entering the eye was subsequently swallowed and taken into the gastro-intestinal tract they found that a small, but definite portion reaches the larynx and trachea, where it may persist as long as a week. In passing from the eyes it traverses a definite channel, according to the eye it has entered. Infectious material that has been ingested is far less liable to reach the respiratory tract than that entering by way of the eye or nose.—*The Eye as a Portal of Infection in Respiration Diseases, H. J. Corper & J. J. Enright, J. Am. M. Ass., February 21, 1920, lxxiv, No. 8, 521.*

Direct Infection in Tuberculosis.—The large number of possible sources of infection makes it difficult to estimate the frequency of direct (patient to patient) infection in tuberculosis. An investigation by the author in South Devon, a rural or semi-rural district, showed that in the first series of 252 cases of all ages, 102 were due to direct infection, 47 to remote infection, 78 no traceable infection, 25 doubtful. In a new series, eliminating all children under 16, 316 adult cases showed 140 due to immediate infection, 44 remote, 112 not traceable, 20 doubtful. Among 96 children under 16, 71 cases were due to immediate infection, 2 remote, 22 not traceable and 1 doubtful. There was no selection in these cases; invalided soldiers were included, which would naturally increase the number of not traceable infections. Eliminating the soldier cases would bring the percentage of immediate infections over 50. In the consideration of the prevention of tuberculosis, this question of immediate infection should not be overlooked. The main channel of infection, and the only important one, is the sputum. Fortunately, the majority of cases of pulmonary tuberculosis are not infectious, or but slightly so, if proper precautions are taken. It is the advanced case that constitutes the danger. A short circular written in plain language should be widely distributed setting forth these facts, explaining the best means of avoiding infection. In addition there should be further study of the subject. The author suggests the frequent inhalation of a spray containing dichloramine-T to render an infective patient less infectious.—*Direct Infection in Tuberculosis, E. Ward, Lancet, January 3, 1920, 22.*

Risk to Human Beings from Open Tuberculosis Among Carnivorous Domestic Animals.—Petit emphasizes the identity of the tuberculous infection of dogs and cats with that of man and calls attention not only to the established frequency with which dogs acquire tuberculosis from man but also to the strong probability that man not infrequently contracts the infection from dogs and cats. Landouzy showed strikingly how fragments of food in taverns and restaurants became mixed with the sputum of persons frequenting these establishments and how often dogs became infected by eating the resulting bacillus laden mixture. The least common type of tuberculous infection attended with danger of transmission to human subjects from dogs and cats is tuberculous pyelonephritis with continuous discharge of tubercle bacilli in the urine. More frequently there is an ulcerative tuberculosis of the intestine, started through ingestion of infected material, and propagating the disease through the feces. Again, pulmonary tuberculosis in dogs and cats, both grossly and minutely identical in its different forms with the corresponding forms seen in man, very often results—without hemoptysis, however—in the formation of cavities opening into the bronchi. The animals do not spit, but they do cough, and in doing so disseminate bacilli widely over the carpet, chairs, clothes, and the hands of their masters. A dangerous and little known source of infection from dogs and especially cats is the tuberculous ulcers—doubtless started by scratching with claws soiled with tuberculous sputum—met with in these animals on the neck, lips, snout, forehead, eyelids or ears. These ulcers wholly fail to heal, becoming deeper and more mutilating, and sometimes reaching a large size. The pus continuously discharged from these dangerous lesions teems with tubercle bacilli. Children, playing with these animals, patting and kissing them and taking them to bed, are undoubtedly much exposed. All cats and dogs in a seriously depreciated state of health, with loss of weight, cough and diarrhea or harboring inveterate ulcerations on the face or neck, should be considered at least as tuberculosis suspects and due prophylactic measures should be taken. —*Les formes ouvertes de la tuberculose chez les carnivores domestiques, J. Petit, Bull. d. l'Acad. d. Med., November 18, 1919, 310.*

Tuberculosis as a Focal Disease.—There are, strictly speaking, no such things as local diseases. What we call general diseases exhibit their characteristic changes only in certain portions of the body, physiologic function being carried on elsewhere, but injury to the smallest and most distant parts may affect the general system in a defensive way. The typical tubercle is a typical local infection. If there is a sufficient colony of tubercle bacilli sufficiently virulent, it produces what we consider typical tuberculosis, and extends itself elsewhere in the body. The author sketches the history of tuberculosis, showing how much was learned after the causative bacillus was recognized, and its pathogenicity really demonstrated. There is only one place in the body where the single tubercle can be recognized and studied and this is in the fundus of the eye. The tubercle present in the ocular fundus varies in dimensions, being 0.1 mm. or larger, and can be watched from its beginning to its complete involution. Its connection with tuberculosis has been the subject of observations by many and has been followed out in the human eye, watching its connection with the disease in other

parts of the body. We have also lately come to identify tuberculous local infections of the retina as a causation of retinal hemorrhages, and Jackson describes the changes that have been noted in considerable detail. The tuberculous focus may occur in any part of the eye, in the skin of the lids as in lupus, and in the conjunctiva in various forms. The great obstacle to the recognition of a tuberculous focal infection has been that we were not looking for it in the right place. In Jackson's experience he has been led to look widely and accept its great chronicity and prolonged latency or arrest. Perhaps not everybody is tuberculous, but it is safest to accept every one as such, presenting symptoms that might arise from this infection. There has been at times an almost hysterical fear leading to folly and inhumanity in the treatment of victims. The preponderance of the lesion at its site of entrance is not the rule, and plays little part in determining the location of the primary focus. The most of civilized people harbor tubercle bacilli somewhere in their systems, and for the mass of us the best defense against the disease is our tissue resistance or immunity. In conclusion, Jackson says: The different forms of this focal infection are one disease—the unity of tuberculosis. A very large proportion of those who suffer such infections never suffer the conditions that were formerly recognized as tuberculosis—phthisis, scrofula, bone disease, etc. At its point of entrance, the tubercle bacillus very rarely provokes any reaction or excites a noticeable lesion. Foci of infection are established within the bodies of a great many people, where they are kept in check by tissue resistance. The overcoming of tuberculosis is chiefly a matter of building up and sustaining immunity by wise and careful living.—*Tuberculosis as a Focal Disease, E. Jackson, J. Am. M. Ass., February 14, 1920, lxxiv, No. 7, 433.*

Predilection of Air Vesicles to Tuberculous Implantation.—*Summary*: (1) The bronchi are accompanied by smooth muscle fibres throughout; at their distal ends all these fibres cease, but a ring of unstriped fibre guards, at these ends, the entrance into the air vesicles. (2) Within the walls of the bronchi a fine network of lymphatics lines the entire walls throughout, but it stops abruptly at the ring of muscle fibres situated at the terminal ends of these tubes. (3) Ciliated cylindrical epithelial cells line the entire bronchi with the exception of the alveolar ducts, the terminal bronchi, which are lined with a cuboidal epithelium. Both the ciliated cylindrical and the cuboidal epithelial cells are of the nucleated variety and they do not extend beyond the ring of muscle fibres mentioned above, But (4) the epithelium which lines the alveolar walls, the air sacs, distal to this ring of muscle fibres, is of the polygonal variety. These epithelial cells are all non-nucleated; within the walls of the air vesicles no lymph vessels are found nor are muscle fibres demonstrable. But it was also observed (5) that epithelial cells which are non-nucleated are short lived, are easily destroyed, have no resistance or defense power and can not protect themselves against foreign bodies, like bacteria, dust particles, tubercle bacilli, etc. (6) It is known that on the living, healthy nucleated epithelium, lining the bronchial tubes, the tubercle bacillus is perfectly harmless. For that reason pulmonary tuberculosis never has its origin in these tubes. Air vesicles are all lined with polygonal cells, which are non-nucleated and which are situated beyond that ring of muscle fibres, which, if competent, that is, in perfect health, will prevent the entrance of the tubercle bacillus upon pulmonary tissue where it grows and vegetates most readily.—*Why Have Both the Primary Focal Infection and the Subsequent Pulmonary Tuberculous Disease Their Origin Nearly Always in the Air Vesicles and not in the Bronchial Tubes? J. Ritter, Ill. M. J., April, 1920.*

Tissue Injury in the Development of Tuberculosis.—As a rule tuberculosis is a chronic condition with exacerbations as a result of the extension of the disease process into normal tissue. In many cases tuberculous patients have had tubercle bacilli circulating through their bodies for several years. Under these circumstances injuries to the tissues are of importance in determining the localization of tuberculous complications. The author cites two cases of chronic pulmonary tuberculosis in which injury to the knee resulted in the development of tuberculosis of the knee joint; one case in which an injury in the vicinity of the right ilium and a later injury to the ankle resulted in the development of localized tuberculous processes; and a fourth case in which an injury to the hand resulted in tuberculosis of the small bones in the injured area. While complications do not always develop in tuberculous patients following injury, such injuries should be avoided as much as possible.—*Tissue Injury an Important Factor in the Development of Tuberculosis, H. F. Gammons, Boston, M. & S. J., January 29, 1920, clxxxii, 119.*

Trauma of the Chest and Pulmonary Tuberculosis.—In this instalment of his long article, Tecon gives the details of twenty-seven cases of war wounds of the chest among soldiers of the Allied armies interned in Switzerland. Tuberculosis had been assumed in all, but only 18.5 per cent had tubercle bacilli in their sputum. In only 7.4 per cent was there any evidence connecting the pulmonary lesion with the war wound. All the men had been long in captivity in Germany, and yet notwithstanding the depressing conditions of their imprisonment, tubercle bacilli only very rarely invaded the lungs and only exceptionally settled at the site of the war wound. This was the more remarkable as some of the men had old tuberculous glandular lesions. Tecon examined further 1033 known tuberculous interned soldiers and found that only 1.1 per cent had had a chest wound at any time, thus confirming his assertion of the rarity of pulmonary tuberculosis consecutive to penetrating wounds of the thorax.—*Traumatismes thoraciques et tuberculose pulmonaire chez les soldats des armées alliées internes en Suisse, H. Técon, Rev. Méd. d. l. Suisse Rom., August 1, 1919, xxxix, No. 8, 361.*

Occupation and Tuberculosis.—In a general article on occupational causes of ill health, the author says that we have only recently begun to appreciate to how great a degree certain dusty occupations, or those in which ventilation is inadequate, or those in which fatigue and other factors lower the bodily resistance, lay the foundation for tuberculosis. Among stonecutters, for instance, 50 per cent of the deaths occurring in two years among the members of one union were due to tuberculosis. In order to gain control of this disease we must give due attention to the importance of these industrial factors, as well as to housing, diet and personal hygiene. Tuberculosis is in no small measure the index of the industrial sanitary conditions in any given community, because good industrial sanitation, improved housing and better living conditions generally go hand in hand, and with them a diminution in the prevalence of tuberculosis.—*Causes of Occupational Diseases, L. T. Harris, N. York M. J., November 29, 1919, cx, No. 22, 880.*

The General Symptoms of Ulcerating Pulmonary Tuberculosis in Infants.—The general symptoms of ulcerating pulmonary tuberculosis in infants must complete the very limited and deceptive local symptomatology. The physical signs of a cavity in the lung are late in appearing if we except a fixed and persistent dulness over the apex; the remainder are hardly worthy of consideration. so little importance can be given them. The general symptoms do not in themselves allow the clinician to differentiate the serious ulcerating forms from the commonplace types of infantile tuberculosis, but they occasionally offer a clinical picture having a characteristic aspect. Fever in infants with a pulmonary cavity is very inconstant and irregular. It may be high, remittent, or continued; there may be a subfebrile state with remissions and it can be truly said that all types of temperature may be indifferently met with. Very high pyrexia is due to the final acute meningeal episodes. The cavity in infants does not, like that in adults, appear to be itself the cause of the pyrexia, and hectic fever does not occur in them. On the contrary, cases of extensive ulcerating pulmonary lesions in infants may be quite apyretic. That apyrexia is common in tuberculous babies is well known, but it is interesting to know that it also occurs when cavities are present. It is probably an indication of a weak general reaction which is also made evident by the slight intensity of tuberculin reaction in infants. The antireaction may be wanting in infants with a well advanced pulmonary tuberculosis, as is often the case in young children. Besides these signs, which are rather the negative elements in the diagnosis of cavernous tuberculosis in infancy, there are other very important symptoms which arise in the digestive tract. These have been well studied by Barbier. Their habitual grouping should lead one to consider them as essentially the result of hepatic insufficiency, or better still, a multiglandular digestive insufficiency. Infants who present these symptoms have irregular stools, indicating an intestinal paresis, the intestine being no longer stimulated by its own or annexed glands. The feces are thick, massive, lacking in color, with a fatty appearance and with a stale or frankly fetid odor. Triboulet's test gives the reactionary biliary deficit, while chemical analysis reveals a defective utilization of fats. The putrid odor of the stools indicates pathological fermentation at the expense of the albuminoids. All these phenomena reveal a profound disturbance of the hepaticopancreatic function. Diarrhea may take the place of the irregular stools, especially toward the end of the process and the cachexia then makes rapid progress. Anemia is the fatal consequence of this digestive insufficiency. It is early in appearance and intense and may largely occupy the scene. A tumefaction of the

liver and spleen which may accompany the anemia is interesting, but it is far from being usual.—*Editorial, Med. Rec., November 29, 1919, xcvi, 887.*

Pulmonary Condition Found in Warfare.—The symptoms in the condition reported on are cough, sticky sputum, slight hemorrhage, and great breathlessness, amounting in some cases to paroxysmal dyspnea. There is dulness in the right infra-clavicular region, bronchial breathing, inspiration being accompanied by numerous râles of varying coarseness, and there is usually loss of weight, strength and appetite. In fact, the patients present all the classical signs and symptoms of pulmonary tuberculosis, with this exception, that there is always a consistent absence, even with refined tests, of tubercle bacilli in the sputum. The patients are persistent mouth breathers, which is due to a well defined deflection of the nasal septum. These patients are generally found among the wounded, who have lain for a long time exposed on the field. The drug treatment of the pulmonary symptoms consists in administration of iodid of potassium and arsenic. However, the main part of the treatment is the diet, which must consist of food in which carbohydrates are reduced to a minimum, with the addition of from 2 to 2.5 liters of milk per day and, if it agrees, cod liver oil in small and increasing doses. As soon as the normal weight is attained, there is an amelioration of the pulmonary condition—*A Pulmonary Condition Found in Warfare, A. Stewart & W. A. Robertson, M. J. of Australia, October 25, 1919, ii, No. 17, 348.*

Undulating Fever in Tuberculosis.—Burnand warns that the only way to keep an instructive record of the temperature in the tuberculous is to record it at least four times a day, at 8, 2, 6 and 9 and join together the figures for the different months in a single curve. By doing this in hundreds of cases at the Leysin sanatorium, he discovered a special wavelike course in seventy-two cases, and a similar course of the temperature within physiologic range in ten patients. Study of his cases seems to show that this undulating type of temperature corresponds to a peculiarly tenacious form of the infection, with insufficiency of the defensive processes and a diffuse, septicemic toxic type of the bacillary lesions. In thirty-nine cases the charts showed a rise and fall from 38°, 39° or 40°C. to nearly or quite 36°C. in two-day periods as a rule, and all except one of these patients died in from three to fifteen months. The undulating temperature within the so called physiologic range corresponded to a much more benign infection, but likewise diffuse, hard to locate and particularly tenacious and chronic. Tuberculin offers the best prospects in treatment in the milder forms of this undulating temperature course.—*De la fièvre tuberculeuse a forme ondulante, R. Burnand, Ann. d. Méd., June 1919, vi, No. 2, 110.*

Hypertension in Tuberculosis.—Although tuberculosis is usually mentioned as one of the great factors in lowered blood pressure this should not blind us to the fact that increase of tension is often present in the individual case. Colbert has analyzed a number of these cases and publishes his results in the *Journal de médicine et de chirurgie pratiques* for September 25. He finds that in chronic pulmonary phthisis hypotension is the rule. The tension diminishes during an access of the disease, and when improvement sets in it increases again. With recovery the tension is within normal bounds. The author restricts his material by excluding subjects over forty years of age and those whose tension is below 18 Pachon as a maximum. He finds increased tension due to various causes as forced feeding and renal complication. He further eliminates the association of tuberculosis with all hypertensive diseases, such as syphilis. Finally he insists that the cases must be or have been of the open bacillary type.

The old idea that a hypertensive tuberculous subject must have kidney disease is exploded by the author's finds. In 300 cases studied over an interval of four years he found 15 who appeared to have an idiopathic hypertension. Among these the maxima by Pachon's scale were 25–26 and the minima 10–11. The pulse was often very rapid just as in the hypotensive. In the hypertensive there is a natural tendency to hemoptysis. The general health in these cases is often surprisingly good, and it is not unlikely that the connection long known between recurrent hemoptysis and a good prognosis for life is associated with elevated blood pressure. Not all hemoptysis is of this type and the so called congestive form seems most akin to it. At the time of the hemorrhage the patient has no fever and is not in the midst of an exacerbation of the disease. The author finds in his own material the same prognosis. When the tension is very high—20 Pachon, for example—it requires treatment. Nitroglycerin and emetine are valuable for reducing the tension promptly. After the hemorrhage has begun the treatment comprises rest, an intramuscular injection of emetine and revulsives.—*Editorial, Med. Rec., November 29, 1919, xcvi, 887.*

Action of Tuberculosis on the Psyche and Character.—As a sanatorium director Amrein is evidently guided by his own experience but his paper is written with some reference to one on the same subject by Romisch in 1904. The psyche in this connection implies the inner existence and the character the outward expression. Naturally the specialist in a long career sees all kinds from irresponsibles to heroes. The psyche and character of the child victim may be omitted in this connection although when the adult consumptive has suffered in childhood from tuberculosis, the early experiences must powerfully affect the mind in one way or another. Most consumptives are young adults or old adolescents whose characters have not had time for development. Other writers on the subject seem to have assumed tacitly that the victim has reached sufficiently mature years to show some responsibility. In such a case there must be a great conflict between the inclinations and the fate which seems to impend. The beneficent effects of work upon the character may not be realized if the subject is an invalid and under strict treatment. The victims are often young people of unusual talent and promise who are ambitious for themselves or others. Incapacitated for work they must think and speculate. They become introspective and upon the one subject of their disease. They read popular articles about consumption and how to avoid and cure it. A singular fact even on the part of the scholarly is a form of the deterioration of taste. While at first one notes the taste for the classics these are in time replaced by stories of crime and its detection. The decline does not stop here, for the next step is to read the frivolous and then to be indifferent to all literature. Even the newspapers pall. In other words the patient suffers from a progressive secondary neurasthenia which goes far to explain his mental make-up. He may even be classed as psychasthenic with his obsessions of using the thermometer at all times and much behavior of the same type. If fairly able to get about he indulges in alcohol and flirtations and his motto seems to be "*carpe diem.*" Idleness is largely responsible for all moral delinquencies, plus the tendency to make the most of what remains of life. His behavior is not paradoxical but about what it would be under his peculiar circumstances.—*Die Tuberkulose in ihrer Wirkung auf Psyche und Character, O. Amrein, Corr. Bl. f. Schweiz. Aerzte. August 28, 1919, xlix, No. 35, 1300.*

Gastric Disorders as an Early Sign in Pulmonary Tuberculosis.—The author reports two cases in which the chief symptoms were gastro-intestinal, including constipation alternating with diarrhea, nausea and vomiting, and pain or a lump-like feeling in the epigastrium. Both had been treated for gastric disorder without relief. They complained of being constantly tired with no refreshment from the night's sleep and showed loss of weight and a rise of temperature in the afternoon; one patient perspired profusely in the early morning. The second pulmonic sound was accentuated. Auscultation in case I showed bronchovesicular breathing over the left apex and a few dry râles over the acromion (Abraham's sign); in case II, prolonged expiration over right apex approaching the bronchial type, with râles. Blood, sputum and urine analyses were negative. As early pulmonary tuberculosis was suspected, rest, good food, and open air treatment were advised. Case II improved in a short time, and found employment in the country, reporting that he feels entirely well. Case I was kept under observation, and in about two months developed cough with bloody expectoration, and tubercle bacilli in the sputum. Under regular treatment for tuberculosis with change of climate, she made a complete recovery. These two cases emphasize the necessity of a complete physical examination, especially of the lungs, in all cases of gastric disorders.—*Gastric Disorders as an Early Sign in Pulmonary Tuberculosis, J. Katz, N. York M. J., October 18, 1919, cx, No. 16, 649.*

Reducing Mortality in Pulmonary Tuberculosis. Clinical experience proves that tuberculosis is curable if diagnosed and treated properly at the right time. Hence early diagnosis is the first important factor in reducing the mortality from tuberculosis. If the tubercle bacilli could be isolated before any damage is done, mortality would unquestionably be reduced to a minimum, but since this cannot be done in the present state of knowledge, a number of symptoms must be taken into consideration in the diagnosis. Pottenger has classified the more important early symptoms as follows: (1) Symptoms due to toxemia—malaise, run down feeling, lack of endurance, loss of strength, nervous instability, digestive disturbances, loss of weight, increased pulse rate, night sweats, rise in temperature; (2) symptoms due to reflex causes—hoarseness, tickling in the larynx, cough, circulatory and digestive disturbances, chest and shoulder pains, flushing of

face; (3) symptoms due to the tuberculous process—frequent and protracted colds, spitting of blood, history of pleurisy, rise in temperature. Many condemn the subcutaneous tuberculin test, yet the Moro and von Pirquet tests are frequently used on account of their simplicity. The X-ray, if employed by a competent man, is of value. The organization of a sufficient number of commissions of competent diagnosticians is necessary to aid the individual physician and to inspire the confidence of the patient. Next to early diagnosis, proper provisions for treatment are necessary in the fight against tuberculosis. Because the disease is most prevalent among the poor, the State must aid in the establishment of a sufficient number of sanatoriums where patients can go for treatment in the early stages before their powers of resistance are greatly diminished.—*The Problem of Reducing the Mortality from Pulmonary Tuberculosis, S. A. Savitz, N. York M. J., December 27, 1919, cx, No. 26, 1068.*

Chest Examination in 1300 Cases Referred for Gastro-Intestinal Study.—The fact that gastro-intestinal symptoms frequently have their source of origin above the diaphragm is shown by the findings in 1300 cases referred to the authors for gastro-intestinal study. A complete examination of the chest by stereoplates and fluoroscope was made in 807 of these cases; a fluoroscopic examination alone in 304; no chest examination in 189. Definite pathology was demonstrated in 506 of the 1300 cases; of this number, the lesion was found to be in the chest in 170 cases. Lung lesions were found in 98 cases, and of these 84 were tuberculosis. The tuberculous cases therefore comprise about 6.5 per cent of the total number studied, or more than 7.5 per cent of the cases in which the chest was examined. Coincident lesions of the lung and gastro-intestinal tract were noted in only six instances. The gastro-intestinal symptoms were of secondary origin in practically all of this group. Most of the tuberculous cases were of a chronic, slowly progressing type, many with extensive infiltration and fibrosis, which had escaped recognition through years of semi-invalidism. Some fairly early lesions were also recognized but this was rather exceptional. It is noted that pulmonary tuberculosis was found in almost exactly the same percentage of cases as duodenal ulcer.—*Analysis of 1300 Cases Referred for Gastro-Intestinal Study, with Special Reference to the Importance of Chest Examinations in such Cases, T. A. Groover and A. C. Christie, Am. J. Roentgenol., November, 1919, vi, No. 11, 571.*

Accuracy in the Diagnosis of Tuberculosis.—As a member of the Advisory Board in the selective service examination, the author found many cases of incipient tuberculosis in men who considered themselves in the best of health. The necessity for the greatest care and accuracy in diagnosis is emphasized by these findings. The following are the most typical symptoms of early tuberculosis: hemoptysis; slightly accelerated pulse and slight rise of temperature in the afternoon; fatigue on slight exertion; loss of weight; short cough with or without sputum. For a thorough physical examination, the patient should be stripped to the waist, and seated at ease with muscles relaxed. The retractions above and below the clavicles, deformity of the chest, atrophy of muscles and limitation of movement of the affected part can be studied by the use of the thoracimeter. The muscular spasms described by Pottenger can also be detected with this instrument. Palpation is an aid in estimating resistance, fremitus and movements of the chest, also in determining muscular spasms. Percussion is useful in mapping out the apical isthmus A slight alteration in the pitch of the percussion note appears early. Auscultation is, however, the most practical method for detecting incipient tuberculosis. Fine persistent râles limited to one portion of the lung that do not disappear on coughing are the most trustworthy sign. In normal children auscultation over the spinous processes shows tubular breathing as low as the bifurcation of the trachea; in the case of enlarged mediastinal glands, tubular breathing is heard lower down. In questionable cases repeated examinations should be made, and all methods used, including complement fixation, skin tests and the roentgen ray. The von Pirquet skin test has proved of some value in the author's clinic, especially in children.—*Necessity of Accuracy in the Diagnosis of Tuberculosis, M. J. Fine, Med. Rec., November 22, 1919, xcvi, No. 21, 831.*

Roentgenological Determination of Pulmonary Tuberculosis.—A roentgenological study of approximately 600 cases of pulmonary tuberculosis was made at Camp Lewis, Washington. In about 300 cases clinical and physical findings were recorded, and laboratory findings noted in the small percentage of cases in which they were positive. The study was made by screen, single plate, stereoscopic plates and by combination of plate and screen. The conclusions drawn from these studies are as follows: The definite determination of

tuberculosis is possible at every stage by the roentgen ray alone, but physical examination is usually necessary to determine the stage and activity of the process. In the incipient stage both plate and screen show definite haziness, peribronchial infiltration, and a marked degree of lessened illumination upon coughing or deep inspiration. In the cortical type the clinical findings are more pronounced than the roentgen evidence, in the peribronchial and bronchopneumonic type the reverse is true. After fibrous infiltration takes place the roentgen findings are almost pathognomonic for the disease, and to a lesser degree for the stage of activity. After calcification takes place the diagnosis of tuberculosis is definite and the degree of activity suspected. In the ulcerative type, acute, subacute and chronic cases, and healed cavities can be distinguished; these must be differentiated from small emphysematous blebs. The latter show no capsule, but an irregular outline; they illuminate upon coughing and contain no fluid in their uninfected stage. In the deep peribronchial type of tuberculosis there is indication of peribronchial infiltration and a fuzzy appearance of the bronchovesicular tree. The existence and activity of massive hilum tuberculosis cannot be definitely diagnosed. In disseminated tuberculosis the lung picture shows nothing definite unless healing takes place with small areas of calcification. The roentgenological picture of acute tuberculous bronchopneumonia in which a peribronchial parenchymal involvement is superimposed upon a chronic fibrous process, is typical. The two most generally recognized pathognomonic signs of pulmonary tuberculosis are lime-salt deposits in the upper quadrants which do not necessarily indicate activity, and the cavity which usually does indicate activity. Calcification areas indicate that there has been at some time an active tuberculous process. If in addition there are indications of fibrosis with no emphysema and little or no retraction, activity is indicated. Tuberculous excavations are unmistakable if studied by plate and screen and indicate activity. They are usually found high in the upper quadrants and are often multiple or bilateral. Any abnormality found in the upper quadrants should suggest the probability of tuberculosis, unless some other condition is definitely proven. A roentgen study is indispensable in treatment by artificial pneumothorax.—*Roentgenological Determination of Pulmonary Tuberculosis, F. E. Diemer and I. H. Cramer, Am. J. M. Sc., December, 1919, clviii, No. 6, 871.*

Cavity Formation and Annular Pleural Shadows in Pulmonary Tuberculosis.—Cavities in the lung are indicated roentgenographically by an area of transparency, greater than the normal transparency of the surrounding lung tissue. Cavities may have a clear cut, sharply demarcated outline indicating a fibrous wall or they may have irregular obscure outlines. Circular or oval areas, even and regular in outline, predominate in the majority of cases. Cavities must be distinguished from true pleural annular shadows, with and without pulmonary disease and from false annular shadows of intrapulmonary bronchial origin. True pleural annular shadows are in most cases larger than true cavities, and of more irregular outline. They appear to be more superficial and are less likely to occur in the apical region. Both of these conditions must be studied in relation to the underlying lung conditions. Intrapulmonary annular shadows occur just outside the hilum area. They are rarely mistaken for cavities, but may be confused with pleural annular shadows. In most cases there is a well defined communication between the shadow and the bronchi. They are rarely seen in the second or third stage of tuberculosis. To make a correct diagnosis, roentgen findings must be correlated with physical findings, and repeated examinations must be made. In the U. S. Army Hospital No. 16 during one year 449 cases were definitely diagnosed as having tuberculosis of one or more lobes; among this number there were 74 cases of cavitation, for which the roentgenological findings are given in tabular form.—*Cavity Formation and Annular Pleural Shadows in Pulmonary Tuberculosis, J. A. Honeij, Arch. Int. Med., January 15, 1920, xxv, 63.*

Significance of Annular Shadows.—It has been customary to interpret all annular shadows in chest plates as cavities. In a chest examination made by the author about a year ago an annular shadow was found, apparently typical of a cavity, but plates made several weeks later showed a marked diminution in the size of the supposed cavity and an absence of fluid, indicating that the first interpretation was at fault. A search of the literature and a study of numerous plates at the Trudeau Sanatorium revealed the fact that annular shadows may indicate the presence of localized pneumothoraces, and not cavities. In making a differential diagnosis between the two, it is found that in the localized area of decreased density (pneumothorax) the outline is irregular both as to contour and density and shades off gradually into the

surrounding lung tissue. The pathology in other portions of the lungs should also be considered, as cavities would be rare in miliary tuberculosis and also in the common type of peribronchial tuberculosis. The best method of differential diagnosis is the taking of serial plates, for changes in cavity formation from week to week are very slight, but in localized pneumothorax they are quite marked. Clinically air pockets indicate a progressive tuberculosis, for they cannot develop unless there is ulceration or rupture of the lung tissue, but there is a great difference in prognosis between a case showing local destruction of lung tissue as in cavity formation and one showing a localized collection of air between the pleura with a superficial involvement of lung tissue, as in pneumothorax.—*Significance of Annular Shadows, W. A. Evans, Am. J. Roentgenol., October 1919, vi, No. 10, 510.*

Threshold-Percussion in Bronchial Lymph Node Tuberculosis.—The author gives a rather extensive review of the many opposing views held by different German clinicians as to the value of percussion in the detection of enlargement of the tracheobronchial glands. In an effort to establish the true status of percussion as an aid in the recognition of this condition, the author examined a series of cases by means of Goldscheider's so called "threshold percussion" in the parasternal and paravertebral regions. The material consisted of 50 children with supposed bronchial lymph node tuberculosis. Caseous pneumonias, and older children with phthisis similar to adults were excluded from the series. In all cases the Pirquet reaction was positive. The results of percussion were controlled by means of X-ray pictures.

Of the 50 cases, in 30 the percussion finding were positive and this was apparently verified by the X-ray plate. Of these 30 "positive cases" the oldest was ten years, and 21 were under five years of age. In 9 "negative cases" the percussion findings were positive (apparently showed enlarged glands) but this was not substantiated by the X-ray. In 5 cases the X-ray showed a definite gland shadow, but percussion was negative. The other cases gave such indefinite results as to be worthless for this study. The author believes, however, that very light percussion in the parasternal and paravertebral regions, especially after the manner described by Goldscheider, is a great aid in the diagnosis of bronchial lymph node tuberculosis in infants and young children, and equals in value the examination by means of the X-ray.—*Ueber den Wert der Schwellenwertsperkussion bei der kindlichen Bronchialdruesentuberkulose, F. Weihe, Jahrb. f. Kinderhk., 1919, Third Series 90, xl, No. 3, 163.*

Focal Auscultation.—Peyret recalls that sound waves are reflected back from an obstacle like light waves, the angle of reflection equalling the angle of incidence. Hence in certain conditions they converge toward the same spot. At certain points, therefore, several waves meet, and the sound therefore is louder at these points, or foci as he calls them. If, for example, a round table is percussed, the point of greatest resonance will be at the center, which is the focus where the sound waves meet. He gives diagrams showing the application of these principles in auscultation of the chest, calling attention to the points where the sound waves converge, and the lines along which there is most convergence, explaining the physical and geometrical laws governing the findings. The ear at the one focal point can hear the percussion sounds from different regions, even from the two apices. The findings are exceptionally instructive under these conditions with incipient pulmonary tuberculosis, as he has determined in examining thousands of tuberculosis suspects in the army. The method is likewise instructive for the heart, abdomen and limbs.—*Rapport sur un mémoire de M. le Dr. O. Peyret concernant l'auscultation focale, M. Lêiulle, Bull. d. l'Acad. d. Med., July 22, 1919, lxxxii, No. 28, 83.*

The Diagnosis of Encysted Tuberculous Pleurisy of the Apex.—The data now in our possession lead to the conclusion that the diagnosis of encysted tuberculous pleurisy of the apex will always be a matter of no little difficulty. Numerous affections may simulate it and therefore should be considered. A pneumonia of the apex may be suspected because of the percussion dulness and absence of the respiratory murmur in the upper lobe, and throughout the area of the fluid collection the voice sounds will have a greater resonance than elsewhere. Now these phenomena are also found in consolidation, while the pain usually complained of at the onset of a pleurisy may be totally absent. A mistake is all the more easy because a certain number of cases of pneumonia of the apex—especially in children—have a single physical sign, namely, dulness, the stethoscopic signs usually being absent. However, the dulness is less distinct in pulmonary consolidation than in fluid collections and does not offer resistance to the exploring finger,

and these are the best signs to go by when a radioscopic examination cannot be had. Radioscopy will reveal in pneumonia a shadow extending over the entire apex, but, as Weill and Mouriquaud have recently shown, it is triangular in shape with the base in the axilla and the apex at the hilum, while in encysted pleurisy the lower border of the shadow offers an upward convexity. If doubt remains as to the diagnosis exploratory puncture should be resorted to.

Tuberculous infiltration of the apex, tracheobronchial lymph nodes with congestion of the apex and unilateral pulmonary and lymph node tuberculosis offer analogous symptoms—dulness and a respiratory souffle with or without râles. In children particularly the search for vocal vibration is often impossible so that the diagnosis may be most difficult. Radioscopy is unquestionably useful because a tuberculous infiltration will give rise to an opacity far less marked and much more diffuse than an encysted fluid collection, while the lower border does not show an upward convex line.

The two other affections which may simulate encysted pleurisy of the apex are hydatid cyst and cancer, both of which give rise to symptoms similar to those of the pleurisy, namely, dulness, decrease of the vesicular murmur, or bronchial souffle. Hydatid cyst usually occupies the middle portion or the base of the apex, while puncture and examination of the fluid withdrawn will settle the diagnosis in doubtful cases. Pulmonary cancer, when extensive, may involve the entire upper lobe, and puncture may not always clear up the differential diagnosis, for in one instance of malignant disease a thick yellow fluid was withdrawn.

Finally, an anterior or posterior mediastinal pleurisy may assume the clinical aspect of encysted pleurisy of the apex. However, one of the anterior mediastinum, whether a purulent or serofibrinous tuberculous pleurisy, is accompanied by more marked pain and dyspnea than that occurring at the apex. The physical signs are found lower down than those at the apex, while the dulness will be more prone to simulate a pericarditis with effusion. On the other hand, the heart will be displaced, but the beats will not be dull so that pericarditis can be eliminated. The radiological examination will reveal an enlargement of the cardiac shadow which is not animated by any beat. Empyema of the posterior mediastinum gives rise to dyspnea, spasm of the glottis, dysphagia, and hoarseness due to paralysis of the left recurrent nerve, all of which are absent in pleurisy of the apex. On the other hand, the physical signs are only to be found in the paravertebral region and radiology reveals a longitudinal opacity filling the clear median space when the thorax is examined obliquely. After all, the best means for arriving at a correct diagnosis of encysted tuberculous pleurisy of the apex is by resort to radiography and exploratory puncture.—*Editorial, Med. Rec., February 4, 1920, xcvii, No. 7, 278.*

Results from Use of von Pirquet Test.—Friedman has performed the von Pirquet test 525 times on 464 unselected patients ranging in age from a few months to eighteen years. Nearly all the children tested were of Jewish parentage, living under conditions comparable with those prevailing among the poorer working classes of the larger cities. Most of the children were of tuberculous parents, many of whom had been inmates of a sanitorium where they had had thoroughly inculcated rules of prophylaxis, which were observed scrupulously in many of the homes. Of the 465 children tested, 39.8 per cent reacted positively, the number of positives among the males being 2 per cent in excess of those in the females. Under 1 year, almost 12 per cent reacted positively; from 1 to 14 years, 55 per cent, and from fourteen to eighteen years, only 51 per cent reacted positively. The highest number of positive reactions was noted during the eleventh to thirteenth year period, with 66.7 per cent; and the lowest at the fifth and the sixth year period, with only 13 per cent positive. Of the 274 children having a tuberculous parent 53.6 per cent reacted positively; of the 181 not exposed in this wise, only 23.2 per cent, or less than half reacted. Of the nonexposed, 135 were born in Colorado, and only 20.7 per cent reacted positively, as compared with 25 per cent of the boys. Of the 126 children born in Colorado and exposed to tuberculosis, 56.4 per cent of the girls and 42.3 per cent of the boys reacted positively. Of 189 children exposed to a parent with open tuberculosis, 58 per cent reacted positively; of seventy-eight exposed to a closed case, 38.5 per cent reacted; whereas, nonexposed children reacted only to the extent of 23.2 per cent. Of those children whose father harbored closed tuberculosis, only 27.6 per cent reacted positively; and when exposed to a mother with closed tuberculosis almost double the number, or 48.4 per cent, showed positive reactions. An observation deserving recognition is, that of the female children exposed to a father with closed tuberculosis, 40.7 per cent become infected; whereas of the male offspring similarly exposed, only 10 per cent or less than one fourth react positively. On the other hand, boys and girls exposed to either parent with open tuberculosis react in about equal ratio; eight children had both parents tuber-

culous, and seven reacted positively. Tuberculous infection is said to exercise a retarding influence on the physical growth of the child. Of children reacting positively, 61.8 per cent are below normal in development, 20 per cent are normal, and 19.5 per cent are above normal. Of those with negative reactions, 56.1 per cent are below normal, 31 per cent are normal, and 12.6 per cent are above normal. Infected children under seven years of age show relatively less developmental impairment than do those above the age.—*Von Pirquet Test and Results of Its Use, E. Friedman, Colo. Med., October 1919, xvi, No. 10, 246.*

Partial Antigens in Diagnosis and Treatment of Tuberculosis.—Walthard refers to the Deycke-Much partial antigens on which so much conflicting testimony is accumulating. He applied them in the diagnosis of tuberculosis on 157 subjects, including 24 clinically healthy, 54 with bone and joint tuberculosis and 43 with urogenital tuberculosis. Only 15 of the total 157 failed to respond and 8 of these were in advanced tuberculosis; the others were normal children and young people. The titre of the response varied widely within brief periods, the conditions being apparently the same at each test. It seems as if the theory of the partial antigens is not based on solid premises, but it is important for research on immunity, and deserves further study as it throws light on many obscure points. Striking benefit was not obtained with the partial antigens in any instance, but some improvement was evident in some of the 29 cases of bone or joint tuberculosis and 5 of urogenital lesions.—*Ueber den diagnostischen und therapeutischen Wert der Partialantigene nach Deyke-Much, H. Walthard, Corr. Bl. f. Schweiz. Aerzte, October 16, 1919, xlix, No. 42, 1577.*

Diagnosis of Tuberculosis of the Kidney.—The following are the most important data upon which to make a diagnosis of renal tuberculosis: (1) Bladder symptoms.—Increased desire to urinate, at first only at night, but later diurnal; painful urination, concomitant with the frequency, which gradually becomes more and more severe; incontinence or great irritability as the bladder involvement progresses. (2) Kidney symptoms.—A dull ache or recurrent colicky pains on the affected side, or on both sides in bilateral involvement. Enlargement of the kidney is a very unreliable finding. The same is true of tenderness over the diseased kidney. Rigidity is found only when the perinephric tissues have been invaded. (3) Fever.—There is little as a rule unless there is a mixed infection or a sudden retention. (4) Urinary findings.—Pyuria may be present except in cases of closed pyonephrosis, or in the early stage of mixed infection. Hematuria may be the first symptom or may appear with pyuria at intervals. Tubercle bacilli can be found in the urine in 80 per cent of the cases by the Forssell or Crabtree methods. (5) Cystoscopy and ureteral catheterization.—This is the most important single method. Unless changes specific of tuberculosis are found in the bladder it is best to suspend judgment until the urine obtained by ureteral catheterization has been studied by culture and staining methods. (6) Pyelography and X-ray.—These yield much information as to the changes in the renal pelvis and parenchyma.—*Diagnosis of Tuberculosis of the Kidney, D. N. Eisendrath, South. M. J., November, 1919, xii, No. 11, 679.*

Fixation Reaction in the Diagnosis of Tuberculosis.—The authors applied the fixation reaction, with the technic recommended by Calmette and Massol, in 141 tuberculosis cases or suspects and in sixty subjects in normal condition or with affections other than tuberculosis. The alexin used in this method is that of fresh guinea pig serum, previously standardized. The hemolytic serum is prepared by systematic injection of goat erythrocytes into horses; it is inactivated by heat and standardized. The patient's serum is decanted and inactivated by heating to 56°C. for thirty minutes or to 58°C. for ten minutes. Two antigens are used. The first is made from tubercle bacilli extracted with distilled water and standardized by means of serum from cattle in an advanced tuberculous condition of known titre. The second is a peptone antigen obtained from an emulsion of tubercle bacilli in 10 per cent Witte's peptone, sterilized, macerated for two or three days at 65°C., filtered and standardized. Clinically, a positive fixation reaction was obtained in 77.77 per cent of the cases of known tuberculosis in the first stage; in 82.05 per cent in the second stage, and in 63.6 per cent in the third stage. In seven healthy persons the reaction was uniformly negative. Excluding all subjects of syphilitic disease in whom the reaction is frequently positive—especially when the Wassermann is also positive—patients suffering from disorders clinically other than tuberculosis furnished only 7.69 per cent of positive fixation reactions. The method is thus of marked, though not positive, diagnostic value. The presence of the antibodies in tuberculous cases does not seem to be an expression of a defensive process, but rather of a reaction to infection.

Their amount increases as the disease progresses, but in spite of their persistence, when the intracutaneous tuberculin test becomes negative, the prognosis is unfavorable. When they disappear, a fatal termination is imminent. At present the fixation reaction is in the front rank of the biological diagnostic tests for tuberculosis.—*Études comparée des faits cliniques et de la réaction de fixation dans la tuberculose avec les antigenes de Calmette et Massol, L. Boez and E. Dubot, Presse Med., September 25, 1919, No. 54, 543.*

Complement Fixation in the Diagnosis of Tuberculosis.—The technique of the tests was as follows: a, Serum inactivated at 56°C. for thirty minutes; 0.1 cc. undiluted used in test. b, Petroff's antigen, diluted with the necessary amount of salt solution as determined by titration. c, Pooled serum from 4 to 6 guinea-pigs in a 1:10 dilution. d, Hemolytic system, 0-1 cc. of 5 per cent washed sheep corpuscles with 0.2 cc. of diluted ambocepter containing 3 standard units. Known positive and negative serums were used as controls. The titrations of complement and amboceptor were incubated in water bath at 37.5° for one hour and the fixation tests in ice box for two hours, then in water bath for thirty minutes, and after addition of sheep cells and amboceptor for one hour. The tests were read immediately. Tests were made on the serum of 186 patients, 103 being active cases, 51 inactive cases; 31 non-tuberculous, and 1 tuberculosis of epididymis some time after operation. Of the 103 active cases, 15 gave ++ reactions, 1 gave a + reaction, 5 gave ± reactions, and 83 gave negative reactions; only 16 or 15.53 per cent of the active cases, therefore gave a positive reaction. Of the inactive cases 50 gave negative reactions, and one gave a reaction and also a ++ Wassermann. Of the non-tuberculous cases, 29 gave negative reactions and one a ++ reaction, and a ++ Wassermann. Of the 103 active cases, 10 gave positive sputum and positive reaction to the test, 6 gave negative sputum, and positive reaction, 41 gave positive sputum, and negative reaction, 46 gave negative sputum and negative reaction. The degree of activity in the 103 cases varied considerably, and all stages of activity were represented in the 16 cases giving positive reaction. The test is apparently of no value as a diagnostic or prognostic aid at least in the type of cases studied. Further tests with patients who had a ++ Wassermann reaction, but no evidence of tuberculosis showed that 45 out of 100 gave positive fixation tests for tuberculosis; in 100 cases with negative Wassermann reactions, but no history or evidence of tuberculosis, 17 gave positive complement fixation for tuberculosis. It is evident that the test with the antigen used is not absolutely specific.—*Complement Fixation in Diagnosis of Tuberculosis, W. H. Moursund, J. Infect. Dis., January, 1920, xxvi, No. 1, 85.*

A Case of Generalized Tuberculosis.—A young man of 18, private in the British Army, presented symptoms of a comparatively mild attack of so called influenza, followed by pain and swelling of the joints of the right hand, and slight pain in the hip, loss of weight, but no marked emaciation. X-ray photographs showed slight blurring of the carpo-metacarpal joint surfaces of the hand, no abnormality in the hip. The temperature was above normal with morning remissions. There was at one time a dry pleuritic rub at the base of the lung, and later occasional crepitation at both bases posteriorly. These signs disappeared, and no other physical signs of lung disease could be found until ten days before death about two months later. After repeated examinations of the urinary sediment, one tubercle bacillus was found. No bacilli were found in the sputum, but the X-ray showed clearly the lesions of a hilum tuberculosis spreading outwards to the surface of the lungs. Tendays before death the patient developed a slight cough, with but little expectoration, and on physical examination, moist crepitations, rapidly increasing in number, were found in each axilla. Death was due to peritonitis, which the autopsy showed was caused by the rupture of a tuberculous ulcer in the pelvic colon. There were also numerous other ulcers in the colon, and a few in the ileum. Post-mortem examination of the lungs showed conglomerate areas of fibrocaseous tubercles scattered more or less uniformly through the lung tissue, but especially evident in the upper lobes. The majority were in relation to the bronchial sheaths, and interlobular septa. The intervening lung tissue showed comparatively little change, but there was decided diffuse fibrosis.—*A Case of Generalized Tuberculosis Presenting Difficulties in Diagnosis, F. J. Nattrass, Lancet, November 15, 1919, No. 5020, 872.*

Deaths and Death Rates from Pulmonary Tuberculosis in New York City and State.—The following table and graphs, illustrating the deaths and death rates from tuberculosis for New York City and State, during the years 1913–1919 inclusive are reproduced from the *Monthly Vital Statistics Review, New York State Department of Health, March, 1920, New Series, vol. i, no. i.*

Pulmonary tuberculosis: deaths and death rates, New York State and large subdivisions, January 1913–1920*

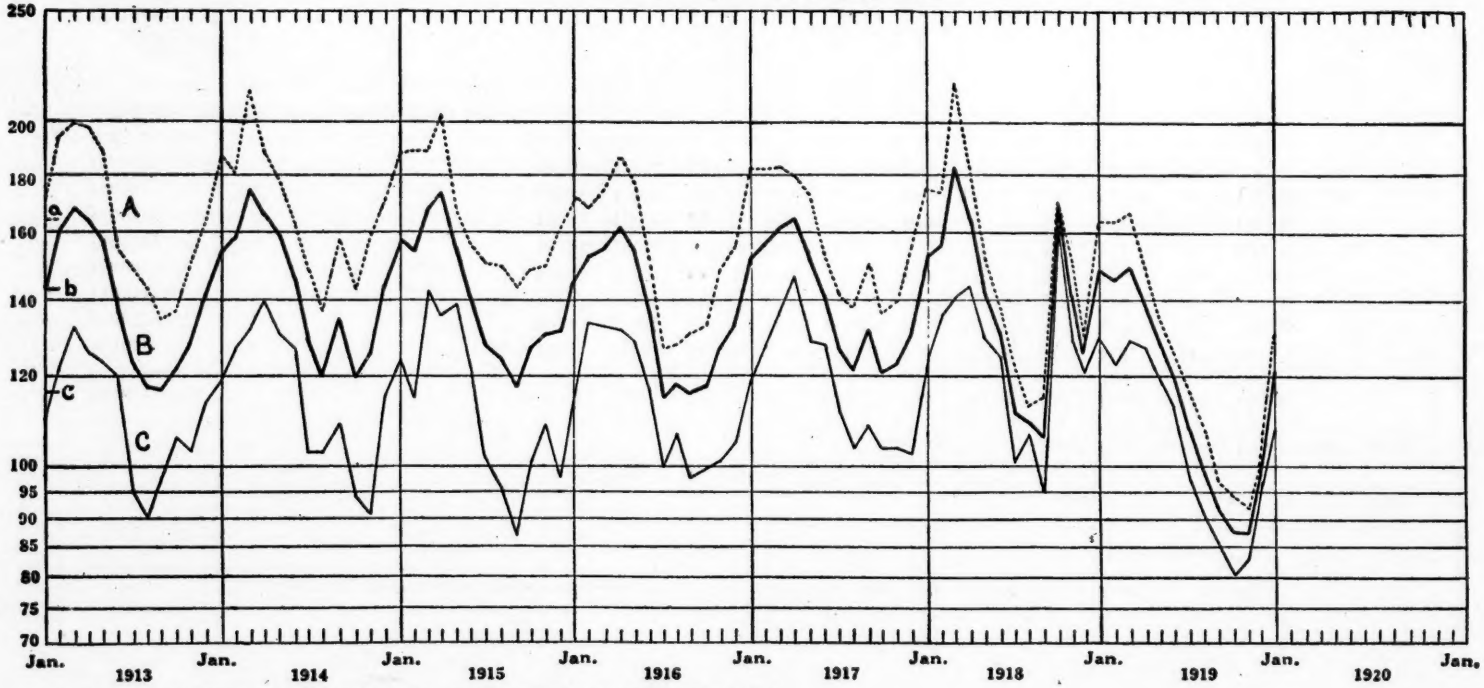
MONTH	YEAR	NEW YORK STATE		NEW YORK CITY		REST OF STATE							
						Total		Urban		Rural		Institutional districts	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
January	1913–'17	1,295	150.9	833	179.3	463	117.4	239	125.0	224	110.2		
January	1913	1,183	143.1	759	171.9	424	110.3	213	113.8	211	107.5		
January	1914	1,301	154.7	840	186.0	461	118.8	248	129.8	213	108.2		
January	1915	1,361	158.4	872	187.7	489	124.1	245	128.1	244	120.3		
January	1916	1,268	145.3	809	170.4	459	115.4	225	116.2	234	114.6		
January	1917	1,363	152.9	883	181.6	480	119.2	264	134.0	216	104.5		
January	1918	1,382	152.7	873	175.4	509	124.9	244	121.6	211	101.5	54	
January	1919	1,374	148.8	836	164.2	538	130.5	241	117.9	241	115.3	56	
January	1920	1,128	120.3	682	131.0	446	107.0	208	100.6	209	99.3	29	

* Deaths per 100,000 population per annum.

NOTE: Data from New York State Health Department Annual Reports and Monthly Bulletins, or specially computed.

DEATH RATE FROM PULMONARY TUBERCULOSIS: NEW YORK STATE, NEW YORK CITY, AND STATE EXCLUSIVE OF NEW YORK CITY: BY MONTHS, 1913–1919

Annual rates per 100,000 population

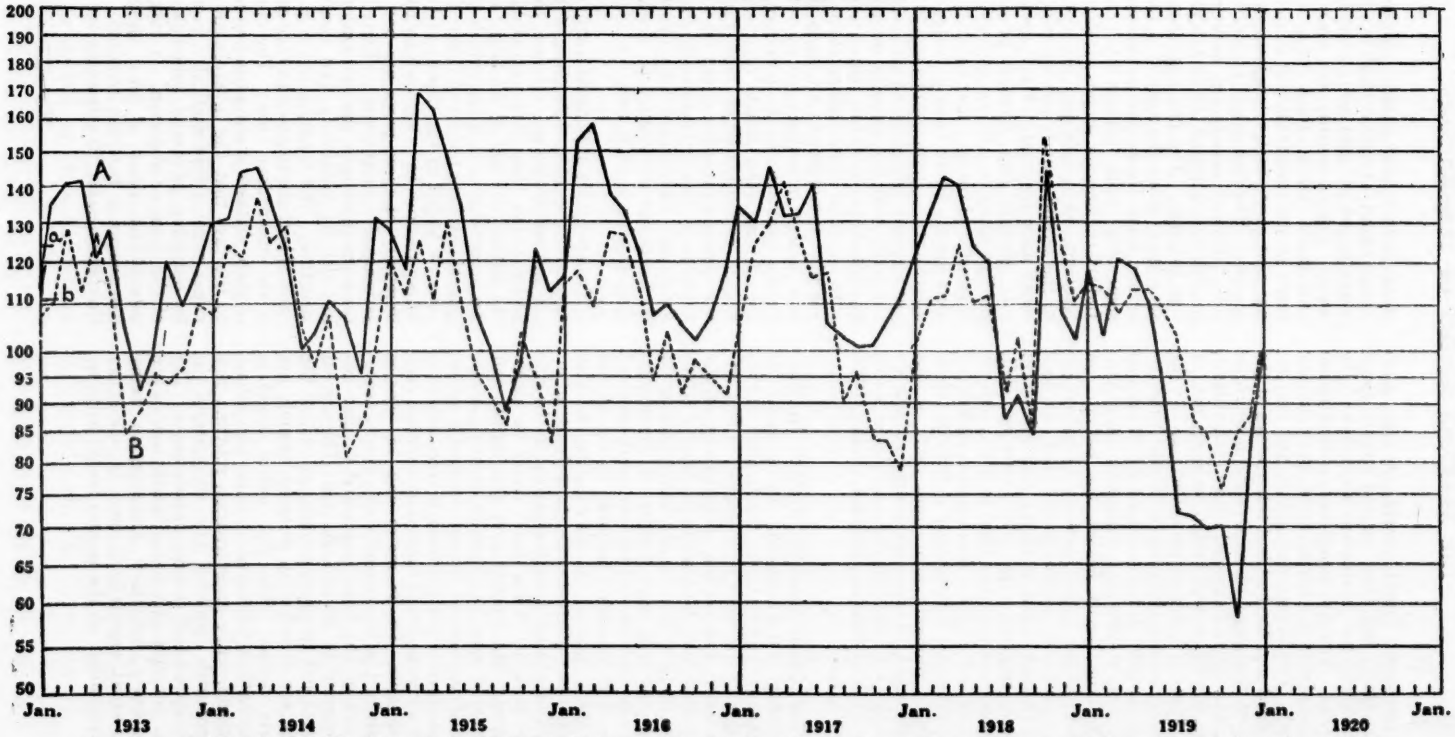


A, New York City; B, New York State; C, State exclusive of New York City

Average annual rates: 1913–1917: a, 164.1, New York City; b, 142.6, New York State; c, 117.1, State exclusive of New York City

DEATH RATE FROM PULMONARY TUBERCULOSIS: URBAN AND RURAL AREAS *(EXCLUSIVE OF NEW YORK CITY): BY MONTHS, 1913-1919

Annual rates per 100,000 population



A, Urban; B, Rural. *"Urban" includes all "cities" (except New York) and certain very large villages, and "rural" includes all remaining districts except institutional; see table No. 11. Average annual rates, 1913-1917: a, 123.9, urban; b, 110.8, rural

Innocent Tuberculosis.—A man, aged fifty-eight, had been treated twenty years previously for tuberculous ulceration of the larynx. The treatment was on sanatorium principles with a few applications of chromic acid. The larynx was healed and had remained so. He had had tuberculosis of the hip at the age of 10, on account of which he walked with a shortened leg and raised boot. The hip lesion was healed, or quiescent, at the time of the laryngeal affection. At the age of twenty-three he developed tuberculous deposits in testes, prostate and seminal vesicles, which also remained quiescent. After the larynx healed, the patient, on advice of the author, gave up his indoor life and took up nature study and outdoor photography, also lecturing and writing on these subjects. He still remains well, though weighing less than in 1900, without active tuberculous lesions, an example of the innocent, long drawn out form of tuberculosis, probably kept from more serious outbreaks by a favorable change in the mode of life.—*A Case of Innocent Tuberculosis, St. Clair Thomson, Tubercle, October, 1919, 1, No. 1, 13.*

The Cardiovascular System in Pulmonary Tuberculosis.—In a study of pulmonary tuberculosis, the detailed investigation of the lungs is, of course, of first importance, but certain disturbances of the cardiovascular apparatus also deserve attention, as they have an important bearing on the methods and results of treatment. In the author's institutional work most of the cases examined belonged to the second or third stage of the disease. In the first stage cases of apparently short duration, no striking change from the normal in the size and position of the heart could be ascertained. The sounds over the mitral and tricuspid area are usually normal; aortic sounds are normal, though frequently accentuated; over the pulmonary area, however, the accentuation of the second sound is very noticeable. Of 25 males and 25 females examined in the second stage, the measurements of the heart suggested cardiac enlargement in 10 of each sex. The second mitral and tricuspid sounds, as well as the first aortic and first pulmonic sounds are fairly normal. The first mitral sound is frequently accentuated in young and robust patients, while indistinctness, splitting and murmurish qualities are encountered in debilitated and chronic fibrous cases. The first tricuspid and second aortic sounds are frequently indistinct, accentuation being less usual, especially in men; in women an accentuation of the second aortic with reduplication is often noted. The second pulmonic sound is rarely normal, but frequently accentuated and also split; occasionally it is weak. Among seventy-five male and seventy-three female third stage cases the heart measurements showed dilatation in 50 per cent of the males, less frequently in the females. The first mitral, second mitral and first tricuspid sounds are indistinct, murmurish or roughened, while reduplication is less frequent. The first and second aortic sounds are about the same as in cases in the second stage, the second aortic sounds being somewhat more frequently accentuated. Indistinct pulmonic sounds are slightly more frequent, while splitting and accentuation of the second sounds and indistinctness are much more frequent. The figures for pulse rate, systolic and diastolic pressures and cardiac pulsation are low, especially in consideration of the fact that the patients' ages were mostly above twenty years, and often above forty. Dermography and the Aschner phenomenon with slowing and dicrotism of the pulse were occasionally present. Signs of cardiovascular failure were more marked with irregular septic temperature. Cardiovascular stimulants of all kinds frequently had neither immediate nor lasting effects. In the treatment of the quiescent stage of the disease, too much exercise without proper medical control may mean overexertion and excessive strain on the cardiovascular system.—*Therapeutic Problems in Pulmonary Tuberculosis with Disturbance of the Cardiovascular System, E. Zueblin, Med. Rec., October 4, 1919, xcvi, No. 14, 584.*

Tuberculosis of Stomach and Oesophagus.—Tuberculous infections of the stomach and oesophagus are very rare, there being probably less than 200 acceptable cases of the former and 100 of the latter on record. An acceptable case is one which presents a typical histologic picture of tuberculosis or of tubercle bacilli in the depths of the lesion. Many theories have been advanced, but the immunity of these parts has not yet been satisfactorily explained. Practically all cases are secondary, the vast majority being infected by continuity and contiguity of structure. The common lesion of reported cases of both the stomach and the oesophagus is the tuberculous ulcer. The clinical side of these diseases is almost non-existent, due to the fact that the involvement is a terminal event symptomatically overwhelmed by obtrusive, advanced, tuberculous lesions of the chest or abdomen. A case showing tuberculous ulcers of both stomach and oesophagus is herewith reported. The author enumerates 50 references for tubercu-

losis of the stomach and 38 references for tuberculosis of the oesophagus.—*Tuberculosis of the Stomach and the Oesophagus, with Report of a Case, S. W. Sappington, Hahnemann Monthly, April, 1920, lv, 227.*

Clinical Types of Abdominal Tuberculosis.—Clinical experience indicates that the widespread exudative type of tuberculous peritonitis is not usually secondary to any demonstrable lesion of bowel, mesentery, or tubes. In most cases it is probably a blood-borne infection of the serosa. It is favorably influenced by simple evacuation of the fluid. In tuberculosis of the intestines, the lower end of the ileum is the most common and the caecum, the next common, site of the lesion. In the ileum the infection attacks the mucous membrane primarily causing necrosis and ulceration. In the caecum and other sections of the large bowel, massive tumors are formed, and the intestinal wall becomes thickened and infiltrated. Operation is always necessary in tuberculosis of either the ileum or the colon when it is associated with definite intestinal obstruction. The choice of operation lies between exclusion by anastomosis and excision. If the obstruction is acute, the former is to be preferred; if subacute, the latter. A mass that is easily isolated is better removed. When such tuberculous bowel lesions are not associated with obstruction, or the obstruction can be relieved by aperients, the advisability of operation depends upon the existence of other lesions in the body. If the lungs are affected, it is usually wiser not to operate. In tuberculous disease of the rectum, surgical treatment can do little; there is no actual evidence that the establishment of an artificial anus is curative. If pelvic abscess develops, evacuation by the intraperitoneal route is to be recommended. The mesenteric glands are frequently the site of abdominal tuberculosis. When the disease is local and limited, operation gives good results. The operation of choice is either enucleation or excision of the mesentery involved with the associated bowel, according to the extent and stage of the tuberculous focus.—*Some Clinical Types of Abdominal Tuberculosis, K. W. Monsarrat, Brit. M. J., January 3, 1920, 5.*

Recurrent Spontaneous Retinal Hemorrhage of Probable Tuberculous Origin.—Tuberculosis has never been absolutely demonstrated to be the cause of recurrent retinal hemorrhages, but investigation of many cases reported in literature furnishes very convincing evidence of the probable presence of tuberculous germs or toxins. One case is reported in which the patient first came under observation after repeated retinal hemorrhages and practically total loss of vision in the left eye. The ophthalmoscopic examination of this eye showed the typical picture of retinitis proliferans; no blood vessels were visible in the mass, but the retinal vessels could be distinctly seen running through it. Examination of the right eye showed dust-like opacities in the vitreous with perivasculitis along the course of the large superior and inferior temporal veins. Chest examination showed râles in the left lower lobe. A few days later there was a large hemorrhage in the vitreous of the right eye and vision was practically destroyed (light perception only). The patient was given an injection of coagulose which was repeated a few days later, and ordered to take gelatin and 5 grains each t. i. d. of calcium chlorid and potassium iodid. Tuberculin injections were begun and continued with increasing dosage for the next six months. Within a week the right eye cleared up, and in two weeks the vision was 20/25 in this eye, although there was a large black clot in the vitreous. There were two recurrences of the hemorrhage in the next month, but both cleared up under the same treatment. The patient was in poor health and coughed considerably, but no positive evidences of pulmonary tuberculosis were found on examination. With out-of-door work and careful hygiene, he regained his health, and has had no retinal hemorrhages for ten months. The right eye still shows opacities in the vitreous; vision 20/25. The left eye is totally blind, with complete detachment of the retina.—*Recurrent Spontaneous Retinal Hemorrhage of Probable Tubercular Origin, R. H. Buck, Am. J. Ophth., October, 1919, ii, No. 10, 731.*

Diagnosis and Prognosis of Solitary Tubercle of the Choroid.—At the onset, this ocular affection is not suspected, as all objective or subjective symptoms are wanting. In the more advanced phases of the process, the lesion gives rise to indefinite ocular symptoms common to other diseases of the eye and it is only by an examination of the fundus that the peculiar character of the tuberculous pseudoneoplasm of the choroid will give a clue to the diagnosis. The solitary tubercle varies in size and never projects more than two to three millimetres above the surrounding surface. It is pale yellowish white, while its borders are gradually lost in the unchanged choroid surrounding it. Frequently, on account of secondary complications, such as corneal or crystalline opacities, it will be found impossible to distinguish the characters of the lesion in the fundus oculi. The globe presents in-

flammatory lesions and a decrease of the intraocular tension; hypotonia is a diagnostic sign of great value. But these symptoms are not sufficiently constant to be considered pathognomonic of tuberculous pseudoneoplasms of the choroid and it is only by puncture of the tubercle, followed by guinea pig inoculation with the material removed, that a positive diagnosis of the lesion can be made. The age of the patient and data regarding the general health are important for the differential diagnosis. This morbid process develops spontaneously in tuberculous subjects, usually with advanced lesions. Solitary tubercle of the choroid has been met with more frequently in subjects between the ages of two and twenty years. If the patient is manifestly tuberculous or when the pseudoneoplasm offers distinctly appreciable characters, the diagnosis is not difficult to make, although this lesion often progresses with characters belonging to true intraocular neoplasms, such as detachment of the retina or glaucomatous accidents. In solitary tubercle of the choroid, the tuberculous masses give rise to distant inflammatory reactions, such as iritis or iridocyclitis, while in the case of a malignant growth no other ocular lesion than that of the tumor itself will be found. Inflammatory phenomena are so exceptional that they should be regarded as a secondary infection superadded to the neoplastic process. A very important point to be determined for the differential diagnosis, to which Zur Nedden has particularly called attention, is the invasion and early perforation of the sclera without being preceded by glaucomatous phenomena, while during the evolution of intraocular growths perforation takes place after a rather long lapse of time always preceded by a glaucomatous phase. A malignant neoplasm invades the entire ocular globe, causing it to project outwardly. This fact has been confirmed many times. In Dupuy-Dutemps's patient the scleral ectasis was marked three months after the onset of the process, while in Natanson's second patient perforation of the sclera occurred at the end of two months. In Botesat's patient there was a marked sclerotic ectasis with perforation three weeks after the onset of the affection. After perforation has taken place the tuberculous neoplasm progresses slowly and in some cases appears to become attenuated. In malignant growths the opposite phenomenon is observed, the neoplasm developing rapidly externally and invading the surrounding structures. Spontaneous recovery from this ocular lesion rarely has been known to occur, even with complete return of the sight, but usually vision is quickly lost, especially in children, while in adolescents and adults the evolution of the morbid process is slower and more benign. A primary tubercle of the choroid appears to progress more rapidly than when it develops in a tuberculous subject, when its evolution is likely to be slower and less serious. Generalization of the process usually takes place after perforation of the sclera, but cases have been observed where symptoms of generalization were manifest before perforation had taken place.—*Editorial, N. York M. J., March 27, 1920, cxi, 560.*

Diffuse Tuberculous Cellulitis.—Some old tuberculous lesions are more or less destructive of the interstitial tissue and have a tendency to infiltrate without arousing a defensive reaction. They are represented by the metastatic abscesses and cold abscesses. They are usually post-operative, but may be idiopathic and are most common in youth. The symptoms are those of a cold abscess of very rapid growth, occurring with a bone lesion or after an operation for osteoarthritis. The skin is rapidly invaded and fistulization develops with discharge of a very small amount of pus. There is always swelling of the nearby lymph nodes and muscular atrophy with trophic disturbance of the skin. The condition, previously always fatal, is now being operated upon with success. The infected surfaces are thoroughly exposed and cauterized with carbolic acid or Merniere's guaiacol solution, which is made as follows: Water, 1000 cc., benzoic acid, 0.06, alcohol, 4 drops, guaiacol, 0.3.—*La Celulitis Tuberculosa Difusa, A. Cortes Llado, Arch. Espan. d. Tisiolog., January, 1919, i, No. 1, 97.*

Erythema Nodosum and Tuberculosis.—Erythema nodosum has been reported as following an injection of tuberculin, and under other circumstances in tuberculous patients. The author has noticed the occurrence of erythema nodosum in chronic cases of tuberculosis when the condition becomes more acute, and in patients under observation as suspects when definite symptoms of tuberculosis become noticeable. He reports five cases. It is not claimed that tuberculosis is the only cause of erythema nodosum, but that the cutaneous symptoms may be caused by many poisons, one of which is that of tuberculosis. Cases observed indicate that the constitutional peculiarity which gives rise to this skin reaction is inherited. Out of 4000 cases of tuberculosis and "contacts" under the author's observation annually, he has not seen any other skin condition, apart from the generally recognized tuberculides, so definitely

connected with tuberculosis as erythema nodosum.—*Erythema Nodosum and Tuberculosis, E. Ward, Brit. M. J., December 20, 1919, 811.*

Sarcoid Tuberculosis of the Skin.—Sarcoid tuberculosis of the skin is rare, and usually benign. The tubercle bacillus can only occasionally be demonstrated in the lesions, and a positive tuberculin reaction is rare. Sarcoid tuberculosis generally begins insidiously; when once established, it is characterized by the presence of multiple nodular masses, isolated or not, in either the dermis, the hypodermis, or both. The single nodules vary in size; they are hard and fibrous, and often movable. Usually indolent, the lesions may become sensitive to pressure or movement, and sometimes are very painful. The general health of the patient does not seem to be affected; and the condition is usually mild and curable. Ronnaud has suggested the following classification: (1) massive sarcoid tuberculosis, (2) sarcoid tuberculosis with large hypodermic nodules, Darier-Roussy type; (3) sarcoid tuberculosis resembling lupus, Boeck-Darier type; (4) lymphosarcoid type (Hougerot); (5) bacillary lymphadenoma type. The three best known and most common types are the Boeck-Darier, the Hougerot's lymphosarcoid, and the Darier-Roussy type. The first, also called the disseminated miliary lupoid type, is an eruption of hemispheric blotches, at first rose-colored, later livid or brown, never ulcerating, always symmetrical, usually situated on the face, shoulders, and extensor surface of the arms. The lymph nodes are often enlarged, and tuberculous lesions elsewhere may be found. In the Hougerot lymphosarcoid type the lesions are small, round, dermic nodules, projecting above the surrounding surface, pale rose color, with dark centers, surface smooth. The chief site is the thorax; the face, neck and limbs are rarely involved. The Darier-Roussy type is hypodermic; the lesions may consist of multiple nodules, or large patches or tumors irregularly bosselated. It is generally conceded that sarcoid tuberculosis is produced in a resistant soil by dead or attenuated bacilli, acting locally by their insoluble secretions. Several treatments have been proposed. Many writers advocate arsenic; sodium cacodylate hypodermically seems to be preferred by the majority. Hectine in the same doses as in syphilis, and arrhenal are advocated by others. The various arsenical products may be varied with good results. Darier obtained good results with old tuberculin. Radiotherapy and intramuscular injections of mercury also have been used. Any of these special measures are good if combined with proper hygiene and attention to the general health.—*Sarcoid Tuberculosis of the Skin, C. G. Cumston, N. York M. J., January 10 and 17, 1920, cxi, 67, 112.*

Tuberculosis of One Hip with Congenital Dislocation of the Other.—A boy of 3½ years presented at the first examination in May, 1916, a congenital dislocation of the right hip, which was reduced by manipulation. Both limbs were encased in plaster of Paris, the right being hyperextended and abducted 110°. In the next dressing a few months later the right hip alone was encased. In January, 1917, a large fluctuating swelling was noted by the mother on the front and inner side of the upper third of the left thigh; movement was free and painless. A radiogram showed necrosis of the ilium and upper part of the acetabulum. Eight ounces of typical tuberculous pus were evacuated. The plaster was entirely discarded, and a modified Thomas splint fitted with a bar along each side of the left limb and a joint controlled by a key opposite the right hip; in this way the right thigh could be abducted at any angle, and the left limb continuously extended and slightly adbucted. A few weeks later a sinus developed in the left groin, but this was dressed daily without disturbing the position of the limb. The sinus closed up in February, 1918, but an abscess developed in the groin and was evacuated. Later the sinus reformed, but was healed and remained so since August, 1918. At the same time the roentgenogram showed the formation of bony ankylosis at the hip joint. The abduction of the right thigh was meantime gradually diminished until the right half of the splint was removed and the patient allowed to exercise the limb. The left hip remains immobilized until a year from the complete healing of the sinus, then the patient will be allowed to get about gradually. At the time of the report, the left hip was firmly ankylosed, and the limb in good alignment; the reduced dislocation on the right side is stable, but with a little external rotation of the limb. The boy's general physical condition is good. —*Radiograms of a Case of Tuberculosis of One Hip Associated with Congenital Dislocation of the Other, A. R. Jones, J. Orthop. Surg., January, 1920, xviii, No. 1, 4.*

Congenital Dislocation of Hip Joint and Tuberculosis.—Among the 2000 cases of congenital luxation of the hip joint at the Rizzoli Institute there were two cases in which the operation for correction of the deformity, or casual trauma, was followed by rapid development of a tuberculous proc-

ess in the joint, although there had been nothing to suggest tuberculosis in the child before. In one, the deformity was bilateral, but the right joint had required more forcible and repeated correction, and the tuberculous process developed in this joint. The child came from a tuberculous family, but roentgenography had shown apparently normal conditions before the intervention. The process had developed in the older child after a trauma, nine years subsequent to the correction of the deformity. Only a few such instances are on record, and the fact that tuberculous processes only exceptionally follow the stress of correction of congenital luxation of the hip joint, testifies anew that trauma alone is not able to induce a tuberculous process in a healthy subject. With inherited or acquired taints, even slight trauma, even any transient overuse of the part, or prolonged morbid congestion may be enough to induce the localization of a tuberculous lesion.—*Tubercolosi dell'anci e Lussazione Congenita, N. Cesarano, Chirurg. d. Org. di Movim, December, 1919, iii, 549.*

False Pneumothorax.—The rare cases in which a rapid roentgenologic examination may suggest localized pneumothorax or hydropneumothorax, when in reality another condition exists, have been studied by Stivelman, under the title of false pneumothorax. These false pneumothoraces do not cause any definite subjective symptoms, and the physical findings over the area involved are those of thickened pleura with retraction of the lung tissue. There is usually a fluid level in the region of one or the other of the lower lobes of the lung, where these penumothoraces usually occur. Their appearance either fluoroscopically or on flat or stereoscopic plates is characteristic of localized hydropneumothorax. Careful observation, however, will disclose the fact that such air collections are extrathoracic and are situated below the diaphragm, which is either pushed or drawn high up into the hemothorax. When situated at the right lower lobe, such gas collections are frequently due to a subdiaphragmatic abscess. The gas formed pushes the diaphragm high up into the thoracic cavity, thus causing the adjacent lung tissue to collapse. When situated at the left lower lobe, they very frequently are due to extreme pulmonary fibrosis with marked upward traction of the diaphragm, and to a more or less dilated stomach. In the former instance the fluid level is caused by the gas-containing abscess, and in the latter instance by the stomach contents. The rarity of reports of the condition suggests the recording of all such cases, so as to avoid a great deal of inconvenience and danger in considering exploratory puncture. It is probable that instances of this condition occur oftener than are reported. Stivelman briefly reports a case of his own observation, and remarks that when these false pneumothoraces occur on the left side they need to be differentiated from transdiaphragmatic hernias, which, when not congenital, are usually due to extensive gunshot or stab wounds. Such may be recognized roentgenographically by their appearance partly above the diaphragm and partly below. He reviews some of the literature on the condition, and concludes that the diagnosis should not be difficult when one keeps in mind that these extrapleural air pouches fail to absorb the gas they contain, as is done in true pneumothorax. The height of the fluid level in a false pneumothorax varies decidedly with the ingestion of food and with the emptying of the stomach. It disappears on fasting. With the use of the fluoroscope a barium bolus may be seen to enter the supposed hydropneumothorax causing a splash and disturbing the fluid level. A localized hydropneumothorax may be simulated by a high diaphragm and stomach caused by extreme pulmonary fibrosis or gastrectasis. This should be kept in mind when an exploratory puncture is contemplated. The article is illustrated.—*False Pneumothorax, B. T. Stivelman, J. Am. M. Ass., January 3, 1920, lxxiv, No. 1, 12.*

Clinical Aspects of Tuberculoma of the Dorsal Segment of the Cord.—From the cases recorded of tuberculomata of the dorsal segment of the spinal cord it is now possible to draw a fairly accurate clinical picture. The onset of the affection is characterized by unilateral development of the disturbances. This unilateral development is noted in twenty-eight out of thirty-eight cases collected from the literature by Ackerman (*Thesis*, Paris, 1914), but in the ten other cases the onset of the affection is not given. The characters of these unilateral symptoms are of either a motor or a sensory type. According to Schlesinger the latter are more commonly observed, especially in the form of thermic paresthesias. It is to be noted, however, that this paresthesia may be present in other forms. Oberndorfer's case began with sensory disturbances. The phenomena of paresis of one of the lower limbs must be regarded as fairly common. According to a correct remark of Schlesinger, the localization of the tubercle in the anterior horn is made evident by disturbances of the motor functions and by paresthetic disturbances when in the posterior horn. In Luce's case both horns were involved and

both varieties of disturbance were present. Finally, attention should be called to a rather frequent manner of onset—it occurred in twenty-five per cent of the cases collected by Ackerman—which is of great diagnostic importance, namely, pain. This is sometimes of the truly piercing variety or it may be fixed, of the nature of intercostal neuralgia, increased by movement or sneezing; in other words, it offers the unmistakable character of radicular pain. It is probable that it is related to lesions of the posterior roots. At the initial phase the paretic phenomena extend over an entire limb. Contracture may appear later in the paralyzed limb. The tendon reflexes are usually exaggerated; those of the patella and tendoachilles are exaggerated only on the side of the lesion and normal on the opposite side. Babinski's sign is positive on the side of the lesion. In some cases this phase of unilateral exaggeration of the tendon reflexes is absent. The cutaneous reflexes are generally attenuated or absent. The disturbances of the objective sensibility may have been looked upon as absolutely essential and often as characteristic by the majority of writers. If in many cases the abolition of all the sensory impulses has been noted in the lower half of the body it is because the case was first examined at a time when the lesion had become bilateral. In a certain number of instances the maximum of unilateral sensitive disturbances is distinctly noted. It would appear that the anesthesia before becoming complete, involves certain modes of sensibility, that of the temperature being the most easily disturbed. In other cases the anesthesia is of the syringomyelic type which, when seated in a nonparalyzed leg, resembles Brown-Séquard's syndrome. As to dissociation of the sensibility—the principal symptom of the affection—it was seen by Oberndorfer fifteen times in twenty-five cases and by Ackerman eleven times in thirty-two cases. But it should be observed that these figures cannot serve as a basis for forming a conclusion as to the frequency of dissociation of the sensibility because, in the majority of cases, the onset of the process had escaped the notice of the medical attendant.—*Editorial Note, N. York M. J., January 24, 1920, cxi, No. 4, 160.*

Lung Suppuration.—The results of the study of 100 cases of lung suppuration are discussed by Wessler, who says that while abscess, gangrene and bronchiectasis are usually treated as rare clinical entities, they are becoming of more interest because of the increasing possibility of curing them by operative procedures. He prefers to consider them together under the head of lung suppuration, and gives a tabulated etiologic classification of his 100 cases, showing the larger number to follow tonsillectomy or other operations, pneumonia or grip. There were six cases following aspiration, and two were tuberculous. Other causes were represented by single instances. They may thus be divided roughly into two groups: (1) those due to the aspiration of septic material into the bronchi, and (2) those due to the various primary lung infections, including frank pneumonias and the postgrippal cases. These two groups are not only distinct in their causation, but differ also in their symptomatology and pathology. This is evident, however, only in their early stages; and in order to recognize these differences, it is necessary to observe them from their inception. The immediate result of the lodgment of infection in the bronchus is to set up a localized bronchiectasis which later invades the lung tissue and then an abscess cavity develops. Suppurative lung conditions begin, whether postoperative or postpneumonic, as a sort of local bronchiectasis. Postoperative and aspiration abscesses are twice as frequent in the upper lobe as in the lower, while the reverse condition prevails with the postpneumonic cases. The physical signs are notoriously uncertain, but the symptoms are plain. In the aspiration cases, the onset occurs after two weeks of foul expectoration with persistent fever and usually slight hemoptysis. The distinction from tuberculosis should offer no difficulty, because of the absence of tubercle bacilli, and the usual localization of the condition. Club fingers occur earlier than in tuberculosis and may be also an aid. It should be emphasized that it is not necessary to demonstrate one or multiple cavities, and such occur only in a fair percentage of cases, and only the larger ones are usually discovered. The prognosis is best in the postoperative cases. but disappearance of symptoms should not be regarded as decisive. Symptoms disappear in many postoperative cases, but recur later. The prognosis of the postpneumonic cases appears to be almost completely bad, but the patients may live for years unless complications occur, and some may enjoy considerable comfort. The medical treatment offers little hope; relief of the cough is an important matter. Acute abscess or gangrene of the lung is not usually an operative condition, but in about one third of the aspiration cases recovery takes place spontaneously in two months. Wessler has little faith in artificial pneumothorax in these cases. In two of the cases in his series in which it was performed, the trouble was aggravated and both patients died suddenly after the last insufflation. The importance

of a bronchoscopic examination is emphasized, especially before operation. Except in cases of long standing, removal of a foreign body may effect a cure.—*Suppuration and Gangrene of the Lung: A Study of One Hundred Cases, H. Wessler, J. Am. M. Ass., December 27, 1919, lxxiii, No. 26, 1918.*

Non-tuberculous Lung Conditions.—Conclusions: (1) We must recognize non-tuberculosis as a disease. (2) A large percentage, estimated at 10 to 16 per cent of diagnosed pulmonary tuberculosis, is not tuberculosis. (3) Too many of our returning soldiers are being classified as tuberculous when in reality they have perfectly normal lungs. (4) Errors in pulmonary diagnosis can be avoided by careful cultural examination of the sputum and the aid of the X-ray. (5) The epidemics of 1917 and 1918 will produce a considerable number of lung abscesses whose diagnosis as pulmonary tuberculosis is inexcusable because fatal to the patient. (6) Early recognition and radical surgery are the means of combating acute and subacute purulent complications, such as lung abscesses or localized gangrene of a lower lobe. (7) Primary tuberculosis in the adult seldom or never begins as a basal lesion. Four illustrative cases are reported. —*Pulmonary Conditions Wrongly Diagnosed as Tuberculosis, W. C. Voorsanger, Cal. State J. M., July, 1919.*

Syphilis and Tuberculosis.—Syphilis, the arch enemy of mankind, not only modifies, and usually for the worse, the course of many diseases, but also, undoubtedly, prepares the soil for numerous infections which otherwise might have been successfully resisted. We are reminded again of this by an article on the association of syphilis and tuberculosis appearing in the December issue of the new British monthly journal *Tubercle.* In this article Dr. Alfred Mirande of Paris points out that Emile Sergent by a series of experiments has not only confirmed the views of those who have shown that there is an association between syphilis and tuberculosis, but has placed the matter in a somewhat new light. Sergent's thesis is thus summarized by Mirande: Syphilis and tuberculosis are two different infections and can develop separately in the same organism. Syphilis produces a soil for the tuberculization of the infected subject, but especially does the syphilis of the father prepare for the tuberculous infection of his child. Many forms of tuberculosis, and in particular scrofula, develop most often in a favorable syphilitic soil. Perhaps the most interesting and suggestive part of the article is that which deals with the subject of tuberculosis in cases of congenital syphilis. According to Sergent, tuberculosis in a young congenital syphilitic, instead of taking on the bronchopneumonic form general in subjects of this age, develops as an excavation, the cavity being either the product of associated action of the treponema and the tubercle bacilli or of the bacilli only. In any case mercurial treatment should be commenced and will help the cicatrization of pulmonary lesions, even when the bacillus of Koch is present. In the case of a congenital syphilitic apparently without lesions, the phthisis becomes sclerotic, and as in the adult is accompanied by asthma and emphysema. Finally, Mirande remarks, it should be remembered that the frequency with which syphilis is found in the children of tuberculous parents, whoever they may be, has prompted Sergent to wonder whether tuberculosis is not often the indirect result of the inheritance of syphilitic soil, and to put forward his claim that tuberculosis may be a symptom of congenital syphilis. In making the diagnosis of a suspected phase of syphilotuberculosis, the following points should be borne in mind: Laryngeal phthisis is often a symptom of syphilis. Fibrous pulmonary tuberculosis should lead to a search for syphilis. If general tuberculosis is perhaps an indirect result of the inheritance of the syphilitic soil, syphilitic pneumopathies often conceal a hybrid association with tuberculosis, and the remedial effect of mercurial treatment is not alone sufficient evidence, when its influence on the soil is known, for discarding the possibility of the presence of tuberculosis. In children many diseases of tuberculous origin, especially scrofula, develop readily in syphilitic soil. Mercury is the treatment advocated by Sergent for the syphilotuberculous and he prefers it given by injections in the form of soluble salts.—*Editorial, Med. Rec., January 10, 1920, xcvii, No. 2, 71.*

Syphilis and Tuberculosis.—This communication from South America emphasizes the unsuspected frequency of inherited syphilis as a predisposing factor in the status lymphaticus, in asthenia and in more or less complex endocrine derangement. Even when no signs of inherited syphilis can be detected, tentative specific treatment is justified, and it may transform conditions previously refractory to all treatment. This is particularly indicated when the parents are robust and free from alcoholism, tuberculosis, malaria and lead poisoning, which might explain the degeneracy of their children. Tuberculosis so often develops on a basis of syphilis, that inherited syphilis

should be suspected, particularly in the masked cases. Tentative specific treatment in addition to the usual treatment for the tuberculosis may induce such improvement that the organism then can throw off the tuberculosis.—*Un mot à propos de la syphilis et de la tuberculose, E. Marina and M. J. C. Mussio-Fournier, Bull. d. l. Soc. Méd. d. Hôp., November 28, 1919, xliii, No. 34, 1002.*

Surgical Aspects of Tuberculosis and Syphilis of the Stomach.—Both these infections may give rise to their respective specific lesions in the stomach as well as in any other of the viscera, and in most varied forms. Regarded for a long time as very rare, they are now becoming more and more frequent as they are better known and are searched for with greater care. Although highly interesting from the viewpoint of diagnosis they are not particularly so, as far as treatment, especially the surgical, is concerned. Tuberculous lesions of the stomach are met with in the form of ulcer and pyloric stenosis, usually due to a periulcerous hypertrophy of the region. The tuberculous ulcer is very similar to ordinary round ulcer of the stomach, but has a more chronic evolution, the hyperacidity is more marked, and the lesion extends superficially rather than in depth. The latter peculiarity, combined with the special property of tuberculous lesions of engendering adhesions of the serosa, results in the fact that perforation into the peritoneal cavity rarely takes place. The prognosis is nevertheless bad; the process will not give in to medical treatment and is more prone to occur in advanced cases of the infection. The surgical treatment—very often contraindicated on account of the miserable general condition of the patient—has usually little effect upon such extensive lesions, contrary to what takes place in simple gastric ulcer, as it cannot reach the fundamental cause of the affection. When the ulcer has not developed stenosis the only surgical treatment is resection—an operation usually too serious to be entertained in these subjects. Tuberculous stenosis is an extremely serious condition and has a worse prognosis than even cancerous stenosis. Medical treatment is perfectly useless so far as a cure is concerned, and operation should be attempted when the patient's condition offers any possible chance of success. The operation may be simply a palliative one, consisting of gasteroenterostomy, which has rarely, if ever, been successful so far as prolongation of life is concerned, the limit of one to two years being the maximum, while pylorectomy is always delicate and very serious in the circumstances. Therefore, tuberculous lesions of the stomach must be regarded as most serious from all points of view and anything like a brilliant result from surgical interference should never be expected. Syphilitic lesions of the stomach are also represented by ulcer and pyloric stenosis in most instances, although other luetic lesions occur; but these seem to be rather uncommon. The diagnosis is often impossible when the patient does not present other evidences of syphilis, but when the true nature of the gastric process has been recognized an intensive specific treatment is naturally to be resorted to at once. Strictly speaking, there is no surgical treatment of gastric syphilis, any more than there is of luetic manifestations elsewhere. However, a certain number of operations for pyloric stenosis of this nature have been done, especially pylorectomy. It is nevertheless well to remember that many cases of pyloric stenosis may properly be subjected to specific treatment, and this line of treatment should be carried out in every case where other manifestations of the disease show themselves and the patient's condition permits delaying surgical measures for a sufficient time to obtain effects by intensive specific treatment. By so doing, one may have the good fortune of occasionally meeting with a case in which the stenosis will disappear, likewise the pyloric tumor.—*Editorial, Med. Rec., April 17, 1920, xcvii, 655.*

The Relationship Between Influenza and Tuberculosis.—Influenza may, as has been frequently asserted, cause a lighting up of tuberculous manifestations in subjects who have apparently recovered from a former tuberculous infection. This awakening of a tuberculosis upon the occasion of a grippal infection recalls by its symptomatology that which takes place after other infectious processes in general. The signs may be given in the order of their appearance as follows: presumptive signs represented by the hereditary antecedents of bacillosis; signs of probability made evident by a long drawn out convalescence, a low blood-pressure, the reappearance of the fever which is irregular with oscillations, the persistency of the cough accompanied by a free expectoration, a progressive decrease of the physical strength which takes the place of the increase occurring in convalescence from an uncomplicated influenza. The sign of certitude is given by the presence of the tubercle bacillus, so that a systematic examination of the sputum should always be carried out in cases of convalescence from influenza which do not frankly recover, but drag on. It should be understood, of course, that the awakening

of a tuberculous process must not be mistaken for influenzal manifestations simulating tuberculosis on account of their development at the pulmonary apex and giving rise to hemoptysis which so frequently accompanies the pulmonary lesion. Hence the importance of laboratory examination of the sputum. It is of great importance not to misconceive the situation, because a fresh development of a tuberculosis must be dealt with vigorously and with no loss of time since the soil has been weakened by the influenza and consequently is less resistant to the bacillus of tuberculosis. It is known that tuberculosis developing in the adult is usually an explosion of an old latent process, because man acquires by tuberculization a relative immunity—a kind of autovaccination. Now, when the subject contracts an infectious disease, his immunity becomes less and the organism may even present a state of antianaphylaxis, especially when the infection is as weakening as is influenza; hence the return to activity of incompletely cicatrized lesions. At the same time that organic resistance is lowered it is quite possible that a hypersensibility may exist in a tuberculous subject—a sort of anergy results from the new infection. The microbic associations are also not indifferent to this process as this association increases the virulence of the bacillus, therefore adding its very marked congestive action to epithelial desquamation which results in and consequently favors the development of the lesions. But although the associated microbic agents of influenza may exert a stimulating action upon the bacillus of tuberculosis, some data seem to show that, in other conditions, tuberculous subjects may possess a kind of indifference towards the grippe, and although apparently contradictory these can be fairly well explained. It would seem that to a certain extent these subjects are refractory to influenza, as has been shown by Bricaire, Bezançon, and Guinard. In progressing tuberculous cases influenza seems to be infrequent and is more prone to develop in patients with a mild tuberculosis. Marfan is of the opinion that tuberculous patients offer a certain immunity to this epidemic affection. That this may be the result of parabacillary microbic associations is possible. Cornil, Babes, Mosny, and Aviragnet have shown the frequency of pneumococci around foci of tuberculosis, while Veillon that of other bacteria—the streptococcus, staphylococcus, and pneumobacillus. There is no reason why individuals with such lesions should not offer a certain resistance to an infectious process whose etiological agents are the very ones encountered in influenza, at least in its more serious and complicated forms. On the contrary, in cases of long standing tuberculosis in which Koch's bacillus is asleep in the midst of a cicatrized lesion, the associates of the bacillus will have returned to their modest rôle of saprophytes. —*Editorial, Med. Rec., March 20, 1920, xcvii, 490.*

Typhoid Fever and Tuberculosis.—The coexistence of typhoid fever and tuberculosis is not infrequent. The two diseases may also be confounded in their beginnings, as miliary tuberculosis with typhoid fever, and pulmonary tuberculosis may also have symptoms simulating typhoid. The available literature reveals only one reported epidemic of typhoid in a tuberculosis institution, which occurred in the Trudeau Sanatorium in 1917. There was a similar epidemic at the West Virginia State Tuberculosis Sanatorium during August and September, 1919. In seeking for the source of infection an investigation of the sewerage of the sanatorium was made. As a creosote disinfectant was used in the lavatories, the taste and odor of which had appeared in the spring water, occasionally used by the patients, the origin of the disease was apparent. Brief notes are given of the eleven cases which occurred, all of them patients, excepting two who were employees, and in all of whom a high temperature developed. Both of the employees' cases were mild. The typhoid patients were removed to the hospital and placed in well ventilated and screened rooms, and when their conditions admitted they were taken out into an open ward and covered with gauze netting. Strict measures were taken in the disinfection of eating utensils and excreta. A high caloric feeding was considered advisable, of which the details are given. The patients were treated with salol, 5 grains every six hours, and 10 drops of dilute hydrochloric acid three times a day, and a tepid sponge bath, also three times a day, followed by an alcohol rub. The effects of typhoid vaccines on sixty-two patients altogether, were observed, and the cases classed as active and inactive. Prolonged bed rest for the typhoid patients was considered advisable. The typhoid vaccine injections caused severer reactions only in the active cases. As regards the effect of the typhoid on the tuberculosis, as observed, the conclusions are that it may cause no detrimental effect in the inactive cases, and, in some, benefit to the active condition may follow. Patients with active tuberculosis may have typhoid fever and recover without any effect on the pulmonary disease, and in this series the tuberculosis did not seem to have any appreciable

effect on the course of the typhoid.—*Effects of Typhoid Fever and Typhoid Vaccine on Pulmonary Tuberculosis, E. E. Clovis & G. E. Mills, J. Am. M. Ass., January 31, 1920, lxxiv, No. 5, 297.*

Differential Diagnosis Between Renal Calculus and Tuberculosis.—Hematuria without pain appears early in tuberculosis; hematuria with pain is constant in calculus. Pyuria without pain appears early in tuberculosis; pyuria with pain appears late in calculus. Pus is present in tuberculosis in excessive amount; in calculus it is minimal in amount. Pain in tuberculosis is diffuse, dull, constant; in calculus it is definite, sharp and intermittent. Chills in tuberculosis are common; in calculus they are rare. There is rise of temperature in tuberculosis, especially in the afternoon; in calculus it is rare. Tubercle bacilli in tuberculosis are sometimes present; in calculus they are absent. The ureter is thickened in tuberculosis, sometimes it is palpable; in calculus it is not palpable.—*Stone in the Kidney and Ureter, from the Standpoint of the Clinical Surgeon, A. J. Ochsner, J. Am. M. Ass., October 11, 1919, lxxiii, No. 15.*

Prognosis in Surgical Renal Tuberculosis.—According to the records of the Mayo Clinic 532 persons were operated on for renal tuberculosis from January 1, 1894 to January 1, 1918. A review of the statistics of these cases shows that renal tuberculosis occurs most frequently between the ages of twenty and forty years (70 per cent); and almost twice as often in the male as in the female. The postoperative mortality in the male patient is somewhat higher than in the female. In children, it occurs more often as a part of general tuberculosis. Evidence of tuberculosis in other tissues may be found in fully 70 per cent of the patients if not in all. The postoperative mortality among patients with coincident lesions is not higher than that of the general average; even multiple lesions, unless they are a part of an acute general infection, do not necessarily render the prognosis more unfavorable. Evidence of healed pulmonary tuberculosis is present in fully one-third of the patients; and the percentage of recovery in these cases is above the average, indicating increased powers of resistance. Coincident active pulmonary tuberculosis was found in approximately 5 per cent of the patients, of whom more than 60 per cent recovered following nephrectomy. Involvement of the genitalia is present in at least 73 per cent of male patients and does not seem to affect the ultimate recovery. The frequency of spontaneous healing of lesions in the prostate and seminal vesicles contraindicates their removal by subsequent operation. Evidence of tuberculosis of the bones and joints was noted in 6 per cent of the cases, of whom one-half showed active lesions. The late mortality was 5 per cent which indicates that such complications may be an index of increased resistance. Spondylitis, usually healed, was present in 5.7 per cent, with a mortality of 12 per cent. Chronic spondylitis does not affect the prognosis; active spondylitis does not offer a favorable prognosis, although it does not contraindicate nephrectomy. Tuberculous adenitis was present in 19 patients (6.4 per cent); the low mortality (10 per cent) indicates heightened resistance. Reduction in hemoglobin does not necessarily affect the prognosis. The mortality with marked bladder involvement is almost twice as high as with slight involvement. The degree of involvement depends on the virulence of the infection rather than the duration of the symptoms. The mortality percentage is markedly influenced by the degree of kidney involvement, increasing in proportion to the extent of the lesion; early lesions have the lowest mortality and pyonephrosis the highest; occluded renal tuberculosis shows relative immunity and low mortality. The duration of preoperative symptoms does not materially affect the late mortality, but bladder symptoms are more likely to clear up when the preoperative duration is short than when it is long. In bilateral renal tuberculosis, recovery or permanent improvement of the remaining kidney will not follow after one kidney has been removed. Operation in these cases is advisable only when there are acute unilateral complications, and then with no hope of eventual recovery. Operative mortality is a negligible factor. Late mortality (five years or less after operation) is approximately 20 per cent; late mortality is much the highest during the first year, decreasing with the length of time after operation. Failure to effect complete cure is approximately 20 per cent. This leaves a prognosis of recovery in 80 per cent and of a complete cure, including cessation of urinary symptoms, in fully 60 per cent.—*Surgical Renal Tuberculosis: The Prognosis, W. F. Braasch, Am. J. M. Sc., January, 1920, clix, No. 1, 8.*

Immunity of Coloradoans.—A conviction held for many years is expressed emphatically in this paper, that most Coloradoans are practically immune to pulmonary tuberculosis. This has been greatly

strengthened by some statistics. Only a very small percentage of deaths from tuberculosis are said to occur among the native Coloradoans.—*Immunity of Coloradoans to Pulmonary Tuberculosis, H. B. Whitney, Col. Med., November, 1919, xvi, No. 11, 268.*

Tuberculosis of the Urinary Apparatus after Fifty.—Lepoutre remarks that Rochet is the only writer he knows of who has called attention to tuberculosis of the urinary apparatus in elderly men. He describes a case of the kind in a man of 58 which proved fatal in little less than a year from the first symptoms. Analysis of some published statistics shows that tuberculosis of the urinary apparatus is not exceptional after 50, and it occurs in about the same proportion in men and in women, but the number of operable cases in men after 50 is exceptionally small. It escapes diagnosis only because physicians do not think of it, as a rule. In 1,530 cases he has compiled from the literature, 44 were in men over 50, and an operation was attempted in only 13 in this group. In the 13 operative cases 7 terminated fatally in one day up to five months; the outcome is not known in 4 cases; one died twenty months later, and only Verhooghen's one patient was still well after an interval of six months. These bad results justify nonoperative treatment.—*De la tuberculose urinaire chez l'homme âge, C. Lepoutre, Presse Med., September 22, 1919, xxvii. No. 53, 535.*

Metabolism of Human and Bovine Tubercle Bacilli.—The authors find distinct differences in the nitrogen metabolism of virulent and avirulent human tubercle bacilli, and also between human and bovine types, as a result of which they offer an explanation of those phenomena of acid and alkaline change in glycerol broth culture which were originally described by Theobald Smith. In a previous series of experiments on rapidly growing, avirulent tubercle bacilli and a number of other acid-fast organisms the authors established the following facts: Such tubercle bacilli produce moderate amounts of ammonia in broth culture, approximately 30 mgm. per 100 cc. on the average, the maximum production being reached about the fourth week in glycerol broth, the reaction becoming progressively acid during this period. From the fourth week on the ammonia content of the broth gradually recedes until at the end of six weeks scarcely half of the maximum amount remains in solution. While the increase in ammonia may be definitely correlated with luxuriance of growth and is in all probability due to deamination of the protein constituents of the medium, the explanation of the recession is less easy. It is coincident with recessive changes in the organisms such as loss in intensity of staining and the appearance of beaded forms. Total nitrogen determinations show a decrease in the nitrogen content of the medium at the height of bacterial development followed by an increase suggesting autolysis of the organisms with liberation of some of the nitrogen in soluble form. A rise and fall of esterase and lipase activity of the bacterial free filtrates of these cultures parallels the rise and fall of ammonia production.

In the recent experiments the metabolism of virulent tubercle bacilli of both human and bovine types was studied. Two virulent human strains were used, 1 mgm. of either of which was sufficient to kill a full grown guinea-pig in three to four weeks on subcutaneous injection. Rabbits were not affected by 10 mgm. The organisms were grown in 250 cc. Erlenmeyer flasks on 100 cc. of 3 per cent glycerol broth, four weeks being required for growth to cover the surface. A large number of inoculated flasks and corresponding number of uninoculated controls were incubated at the same time and determinations were made each week of the titratable acidity to both neutral red and phenophthalein, and of the ammonia and amino acid nitrogen. The lipolytic activity was also estimated. Four bovine cultures were studied in the same way, two of which were very virulent, 1 mgm. being fatal for rabbits. Several milligrams of the other two cultures were required to kill. Rate of growth was inversely proportional to virulence. The noteworthy chemical features of the growth of the human tubercle bacilli were the production of an acid reaction together with a gradual decrease in the ammonia, amino acid, and total nitrogen of the medium up to the point of maximum development of the culture. Later, seventh to eighth week, an increase in ammonia and amino acid nitrogen in solution was noted, presumably due to autolysis of the bacilli. The primary decrease in the ammonia content of the medium followed by a late increase, are in sharp contrast to the conditions noted in avirulent cultures, where an early increase in ammonia occurs, followed by a decrease after several weeks. In bovine cultures a slight but progressive increase in titratable alkalinity was noted. At the same time a steady increase in the ammonia and amino acid content of the medium took place. All these features are the reverse of what seemed to be char-

acteristic of the virulent human strains studied. The explanation offered for these differences in the nitrogen metabolism of human and bovine strains in glycerol broth is as follows: The development of an acid reaction by human bacilli together with minimal deamination, as shown by the decrease in the ammonia content of the medium during the period of growth, suggests that the glycerol is utilized largely for the energy requirements of the bacilli, yielding acid products in its breakdown, but shielding the protein constituents of the medium. That is, the latter are broken down only as their nitrogen is needed for incorporation in bacillary substance, the glycerol sufficing for consumption to produce heat and energy. In the metabolism of bovine bacilli, on the other hand, protein shielding is not in evidence. The development of an alkaline reaction, together with unmistakable evidence of deamination and cleavage of protein to amino acids, indicates that bovine tubercle bacilli cannot or do not ferment glycerol. This appears to be the true explanation of the difference in reaction curve of the two types of organism. The esterase and lipase content of the filtered cultures was practically nil in the virulent strains, both human and bovine, while it increased with growth in the avirulent cultures. The experiments on metabolism have so far not revealed the underlying cause of this.—*The Metabolism of Virulent Human Tubercle Bacilli. (Studies in acid-fast bacteria XI). The Metabolism of Bovine Tubercle Bacilli. (Studies in acid-fast bacteria XII). A. I. Kendall, A. A. Day, and A. W. Walker., J. Inf. Dis., January 1920, xxvi, 45–51 and 77–84. Cf. Studies in acid-fast bacteria I-X, ibid., November, 1914, xv, 417–471.*

Methods for Concentrating and Isolating Tubercle Bacilli.—To the sputum, caseous pus, or moderately cut or minced tissues add a few mils of the sodium hydroxide solution (Sod. hydrox. 70.0; aq. dest. ad 250.0). Mix well and add Rice's bromine solution (bromine 30.0; sod. brom., 30.0; aq. dest. ad 250) in successive small portions until a clear liquid is obtained. The use of heat is not necessary. The liquid is then diluted with distilled water to reduce the specific gravity and is centrifuged at high speed to precipitate the bacilli. These are then washed with two successive portions of distilled water, centrifuging to remove the alkali. The residue is mounted on a microscopic slide in the usual manner, using a trace of albumin to fix on the slide.—*A Convenient Method for Concentrating and Isolating Tubercle Bacilli, H. J. Goeckel, Med. Rec., November 15, 1919, xcvi, No. 20, 804.*

Stain for Tubercle Bacilli.—The acids used to decolorize the bacilli with the usual technic are too powerful and detract from the effect. To avoid this the author uses methylene blue in excess in a solution of 40 cc. lactic acid in 160 cc. distilled water, and adds to this at the time of using four parts of alcohol (95 per cent). This both decolorizes and recolors at the same time, with the finest and most constant results. It has shown up tubercle bacilli in sputum, urine and stools when the Ziehl gave negative findings, and the accuracy of the lactic acid method was confirmed by the course of the cases. The nonacid resisting bacilli can be differentiated more readily, and the whole procedure takes less time than the ordinary technic.—*Sulla colorazione dei bacilli tubercolari col lacto-bleu di metilene alcoolico, A. Gasbarrini, Policlin, July 23, 1919, xxvi, No. 28, 874 (sezione pratica).*

Bacteriology of Tuberculous Abscess.—Demolon found inoculation of guinea pigs the most reliable means to determine the bacillary nature of a cold abscess, as he shows by three typical case reports. The inoculations may prove positive up to the very last traces of the healing abscess. It is evident therefore that the healing of these abscesses is due to some clinical process other than sterilization. Under vigorous disinfectants the pus may give negative findings for a time, but as soon as the disinfectant is stopped, the bacilli may reappear from their lurking places in the deeper tissues. During the entire course of treatment, even with camphorated naphthol, the bacilli seemed to retain the same virulence, judging from the action on the inoculated animals.—*Bacille de Koch et tuberculoses externes, A. Demolon, Paris Méd., September 20, 1919, ix, No. 38, 234.*

Source of Infection and Course of Tuberculosis.—The material studied consisted of 500 cases of tuberculosis in children at the Berlin Charité in 1916, 1917 and 1918. The first question the author attempts to answer is whether or not there is a relation between the course of tuberculosis, and the source of the infection (familial or extra-familial) or the presence of a hereditary taint. Of the 500 cases, in 218 the source of the infection could not be determined, while in 67 cases it was not in the family (extra-familial) and in 215 lay within the family circle. The cases running an acute course (especially miliary tuberculosis, tuberculous meningitis, and the caseous pneumonias) were more frequent in those with extra-familial or unknown sources of infections. On the other

hand, cases in which the source of the infection lay in the immediate family were prone to develop a more chronic or less virulent form of tuberculosis. Of 25 cases of miliary tuberculosis, in 13 (52 per cent) the source of the infection could not be determined. Of 87 cases of tuberculous meningitis in 43 (49.4 per cent) the source of the infection could not be determined, and 33 were from a tuberculous environment. In 54 (62 per cent) there was no hereditary taint. Children in a tuberculous environment contract tuberculosis oftener than in non-tuberculous surroundings, but it would seem as though frequent exposure to tuberculous infection leads to the production of a certain degree of immunity. Hence even in the presence of a hereditary taint, the death rate is lower and the infection shows more of a tendency to the production of milder and more chronic lesions which often result in ultimate cure. The location of the lesion is very important for prognosis. A pulmonary lesion in childhood always has a tendency to dissemination and eventually to cause death. Tuberculous meningitis is always, and tuberculous enteritis almost always, fatal. Tuberculosis of bones and lymph glands is apt to be limited to these structures, and often results in complete recovery. Tuberculous pleurisy also gives a good chance of ultimate recovery—*Die Abhaengigkeit des Tuberkuloseverlaufs beim Kinde von den Infektionsbedingungen der Hereditaeren Belastung und der Lokalisation der Tuberkulose, Helene Eliasberg, Jahrb. f. Kinderhk., 1919, xxxix, Ser. 3, No. 39, 77.*

Westward Migration of Indigent Tuberculous Persons.—It is a common and fallacious belief held by hundreds of tuberculous persons that the climate of Denver is so favorable to the cure of tuberculosis that the mere being there, even if without funds, will bring relief to the sufferers. Our attention has been called by the Denver Anti-Tuberculosis Society to the disastrous results of this belief. It has been estimated by the United States Public Health Service that at least four hundred tuberculous persons go to Denver each year without sufficient money for adequate treatment. They arrive at their destination, often penniless and without having made any inquiries or provisions for their needs, expecting to maintain themselves by some sort of light work. To find such work, however, or work of any kind for a person with active tuberculosis is practically impossible, as the demand for it is always many times greater than the supply. Since Colorado has no state tuberculosis sanatorium and Denver has no such municipal institution, the care of these persons is limited to the following places, which are so over-taxed continuously that it is a long and difficult matter to gain admittance. There are two free Jewish sanatoria with a capacity of one hundred and fifty beds each, which accept a certain proportion of Gentiles. Patients must apply from their place of departure, and await notification before going to Denver. The waiting lists are always long, and it is usually months before an applicant can be admitted. The County Hospital and the County Poor Farm have a combined capacity of fifty-nine beds. Only those persons having at least one year's legal residence in Denver are eligible for admission. There is also a small home for a dozen destitute women, and a small tent colony for indigent tuberculous men, located on the outskirts of the city and maintained by public subscription. The tuberculous person who seeks to regain his health in Denver should have sufficient funds for at least two years' good care. A few weeks or months in a lodging-house, or even in a sanatorium, seldom result in any lasting benefit, and often are merely a waste of time and money. Plenty of good food, rest, fresh air, and medical attention are absolutely necessary for recovery, and must be continued over a sufficient length of time to secure an arrest or a cure. A person without funds can not be provided with these essentials; the resultant anxiety, homesickness, hopelessness, and desperate necessity of working before he is able, especially if he has a dependent family, usually lead to a breakdown far more serious than the original condition. A number of communities in different parts of the country are now making an earnest effort to control tuberculosis among the indigent and those without sufficient funds. It is to be hoped that more states will awaken to their individual responsibilities and will build state sanatoria with capacity to care for all their indigent tuberculous. In the mean time, every effort should be made to dissuade indigent tuberculous persons from undertaking the disastrous journey to Denver; for although a favorable climate may facilitate cure, the patient who is unable to pay for food, rest, and proper care in Denver and can obtain them at home, has a better chance of recovering, if he remain where he is.—*Editorial, Boston M. & S. J., April 15, 1920, clxxxii, 405.*